THE Journal

OF THE AMERICAN DENTAL ASSOCIATION

DECEMBER

1954

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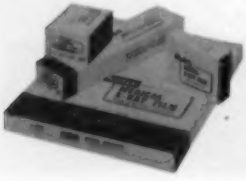

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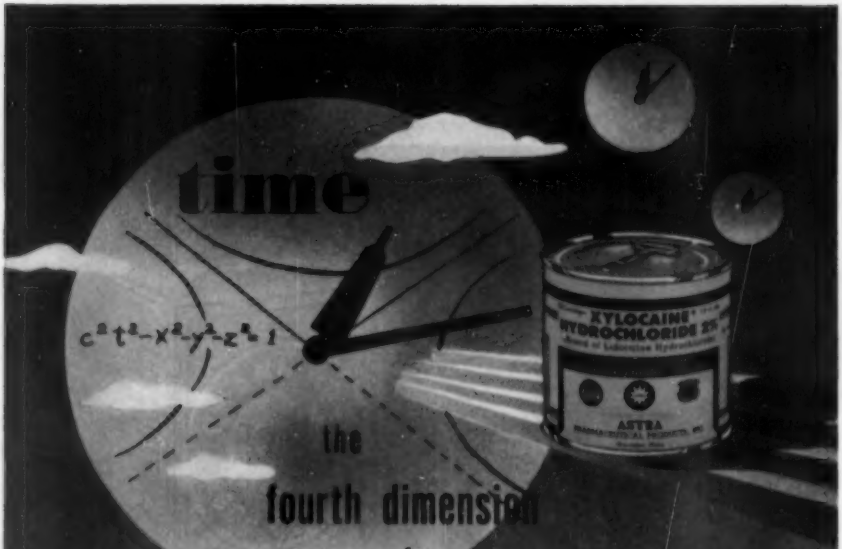

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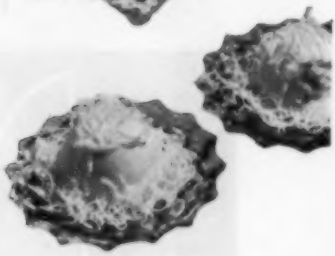

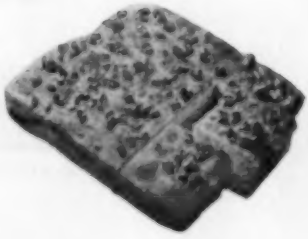

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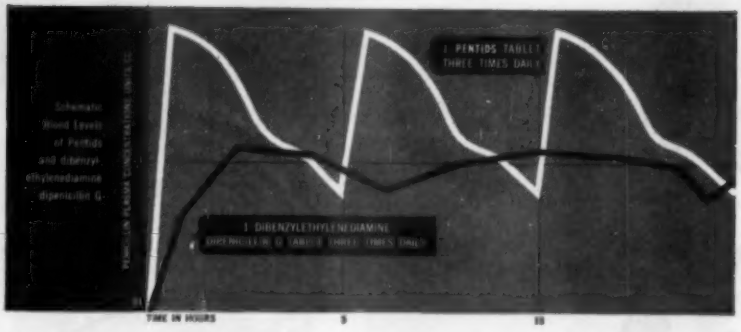

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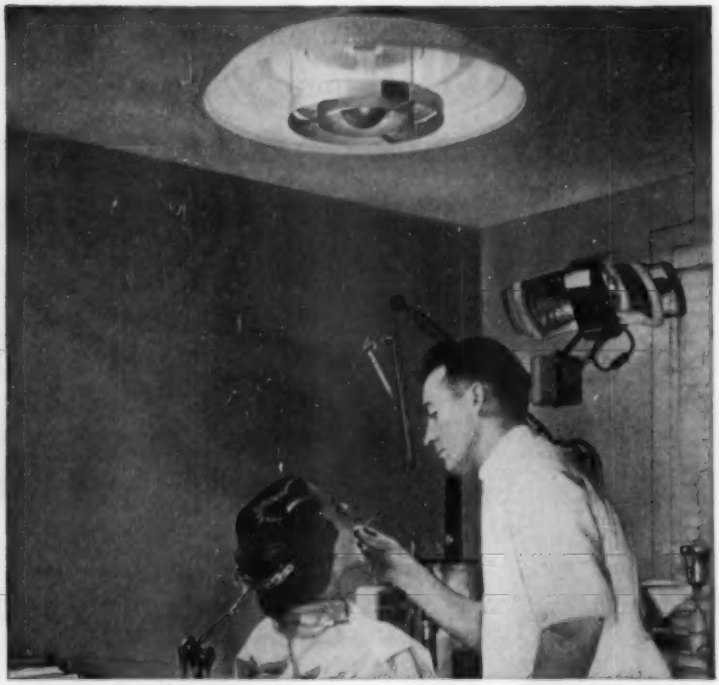

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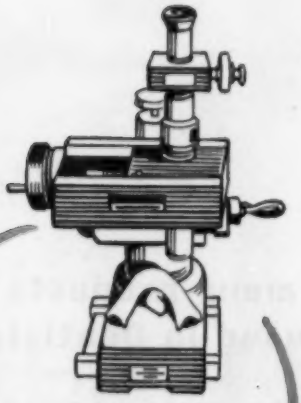

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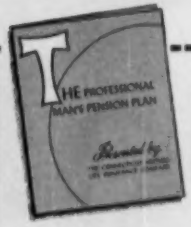

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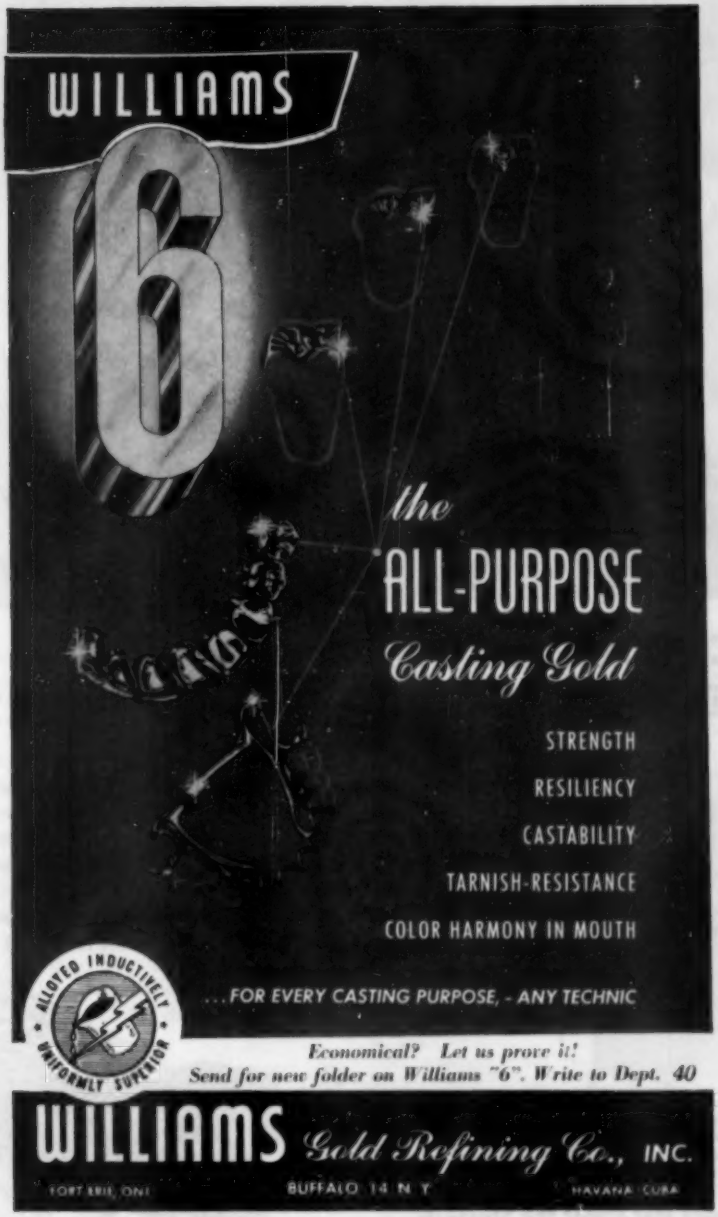
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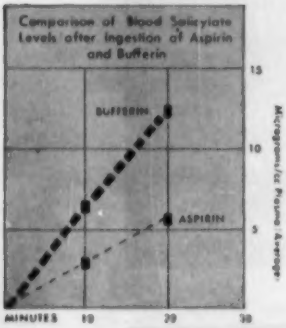

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THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Response of human pulp to gutta-percha and cavity preparation

Verda Elizabeth James, D.D.S.; Isaac Schour, D.D.S., Ph.D., and John M. Spence, D.D.S., M.S., Chicago

The purpose of this study was to investigate the effect of baseplate gutta-percha on the dentin and the pulp in human teeth. Approximately half the cavities were prepared by the rotary type bur technic. The others were prepared by the air-brasive technic.

An attempt was made to analyze the histologic changes in the pulp, not merely in terms of the presence or absence of inflammatory reaction but also in terms of the particular morphology of the odontoblasts and their adjacent cells. In addition, an effort was made to develop more objective criteria for the assessment of pulpal responses.

A careful review of the literature reveals only one report on the effect of gutta-percha fillings in human teeth. Rovelstad and St. John[1] in their investigation of the effect of sodium fluoride application on freshly cut dentin of human teeth used gutta-percha fillings for controls. They studied 9 teeth of patients 11 to 13 years of age for periods of 1 hour to 21 days after the insertion of gutta-percha. They observed hyperemia, hemorrhage and cellular infiltration in the pulpal tissues and "a possible increase in the width of the predentin." There was no apparent break in the regular arrangement of the odontoblasts.

Gurley and Van Huysen,[2] in connection with a study of the pulpal response of dogs' teeth to various filling materials

Presented by Isaac Schour before the Section on Operative Dentistry, ninety-fourth annual session, American Dental Association, Cleveland, September 28, 1953.

This investigation was carried out under Contract No. W-49-007-MD 140, with the Medical Research and Development Board, Office of the Surgeon General of the United States Army.

Departments of histology and operative dentistry, College of Dentistry, University of Illinois.

1. Rovelstad, G. H., and St. John, W. E. The condition of the young dental pulp after the application of sodium fluoride to freshly cut dentin. J.A.D.A. 39:670 Dec. 1949.

2. Gurley, W. B., and Van Huysen, Grant. Histologic response of the teeth of dogs to operative procedures. J. D. Res. 19:179 April 1940.

and operative procedures, reported that they observed inflammation and limited secondary dentin formation in some of the teeth which they filled with gutta-percha. Barker[3] reported similar observations without specifying the species studied. The observations of these investigators were inconclusive.

MATERIALS AND METHODS

The present study is based on the histological investigation of 38 permanent, noncarious teeth. These were obtained from 10 patients 11 to 19 years of age and 3 patients 25 to 45 years of age. The experimental period ranged from 3 hours to 36 days. The teeth of the younger patients were extracted for orthodontic reasons.

In 15 teeth, labiogingival cavities (Class V) were prepared with a sharp no. 37 inverted cone bur run at a moderate speed with intermittent application. Twenty Class V cavities and 1 Class I cavity were prepared with an Airdent machine with aluminum oxide as the abrasive. The same operator (J.M.S.) prepared all the cavities. He attempted uniformity in cavity preparation. The cavities were cleaned and dried by means of an air syringe. The rubber dam was used with the airbrasive technic. The baseplate gutta-percha was warmed to a puttylike consistency and placed in the cavity with moderate pressure. The experimental procedure used was similar to that which is commonly employed in clinical practice.

Histological Preparation • Immediately after the extractions, the teeth were ground under running water on the mesial and distal surfaces with a diamond disk.[4] An effort was made to remove only the enamel and part of the dentin and not to expose the pulp. The tooth was left as a thin disk, facilitating fixation, embedding and cutting. The gutta-percha was removed at this stage. The teeth were fixed either in 5 per cent neutral Formalin or Zenker's Formol solution.

The teeth were decalcified in 5 per cent nitric acid and embedded in celloidin. The sections were cut to the thickness of 10 microns and stained with hematoxylin and eosin for general study. In some cases serial sections were prepared. The special stains used included Mallory, silver, Mallory with silver, and iron hematoxylin.

Histological Studies • Regions in the same tooth above and below those influenced by the cavity were selected for controls. In addition, histological studies were made of 2 unoperated teeth of patients of comparable age.

The dentin remaining between the bottom of the cavity and the pulpal surface was measured along the course of the odontoblastic processes. The histologic sections were evaluated on the basis of the criteria listed in Table 1.

FINDINGS

Control Regions and Control Teeth • To have a base line for comparison with the experimental changes, it was necessary to study and describe the appearance of the dentinal and the pulpal tissues in the adjacent regions unaffected by the experimental procedure and in the unoperated teeth of patients of comparable age.

The predentin layer varied in width from 20 to 30 microns. In silver-impregnated specimens the cementing substance appeared light pink, whereas the fibrils stained greyish and coursed parallel to the surface of the pulp.

A continuous, extremely thin membrane, 0.5 to 1 micron thick, intervened between the predentin and the odonto-

3. Barker, J. N. Reactions of the pulp to various filling materials and clinical procedures. Austral. J. Den. 46:226 Dec. 1942.

4. Orban, Balint; Ritchey, Beryl T., and Zander, H. A. Experimental study of pulp changes produced in the decompression chamber. J. D. Res. 25:299 Oct. 1946.

Table 1 • Experimental changes in dentin and pulp in 38 human teeth filled with baseplate gutta-percha

	Duration of experiment	Control	3 hr.	24 hr.	3-7 days	11-14 days	17-21 days	24-28 days	35-36 days
	No. in group	2	2	1	5	9	7	7	5
DENTIN									
Pre-experimental		Normal	Normal	Normal	Normal	Normal	Normal	Normal	Normal
Reparative (experimental, secondary)		—	None	None	None	None	Present	Present	Present
Predentin in microns		20-30	20-30	20-30	15-20	Irregular	Irregular	Irregular	Irregular
PULP									
Odontoblastic layer									
Pulpodentinal membrane		Contin-uous	Inter-rupted	Inter-rupted	Inter-rupted	Inter-rupted	Inter-rupted	Inter-rupted	Inter-rupted
Mature odontoblasts		****	***	***	**	*	*	*	*
Young odontoblasts		—	None	None	None	None	**	**	*
Preodontoblasts		—	*1	*	*	**	*	*	*
Total number		Normal	Reduced	Reduced	Reduced	Reduced	Reduced	Reduced	Reduced
Korff's fibers		Regular	Irreg.	Irreg.	Irreg.	Irreg.	Irreg.	Irreg.	Irreg.
Polymorphs		—	None	+	++	++	+	+	+
Subodontoblastic layer									
Cell-poor and cell-rich zones		Normal	Cell-poor zone invaded and fused with cell-rich zone						
Inflammatory cells in pulp below odontoblastic layer		—	None	+	++	+++	+++	+++	+++
RESPONSE									
Defensive									
Acute inflammation		—	?	Present	Present	Present	Present	Subsided	Subsided
Chronic inflammation		—	None	None	None	Present	Present	Present	Present
Reparative									
Cellular differentiation		—	Active	Active	Active	Active	Active	Active	Active
Reparative dentin		—	None	None	None	None	Present	Present	Present

**** represents normal optimal number of cells. ***, **, * represent corresponding smaller numbers.

Plus values are group averages graded according to Kramer and McLean (1952): +, occasional cells; ++ and +++, moderate number of cells; ++++, large accumulations or intense focal or diffuse infiltration of cells.

1. Only in subodontoblastic layer.

blastic layer (Fig. 1). This membrane was intensively basophilic in sections stained with hematoxylin and eosin, was slightly blue in those stained with Mallory's dye, and remained unstained in the silver-impregnated specimens. The membrane was characterized by the appearance of regularly spaced dots which stained intensively red with Mallory's dye. This membrane has been termed the pulpodentinal membrane.[5] The dots have been described as part of a terminal bar apparatus.[6]

The odontoblastic layer varied in width from 30 to 50 microns (Fig. 1). The odontoblastic cell bodies measured approximately 8 to 12 microns in width and 20 to 28 microns in height. They had a strongly basophilic nucleus which measured about 5 microns by 10 microns (Table 2). Nucleoli could not be distinguished. The cell membranes were not

5. Bradford, E. W. An investigation into the structure of the pulpo-dentinal junction. Brit. D. J. 88:55 Feb. 3, 1950.

6. Orban, Balint, editor. Oral histology and embryology, ed. 2. St. Louis, C. V. Mosby Co., 1949, p. 138.

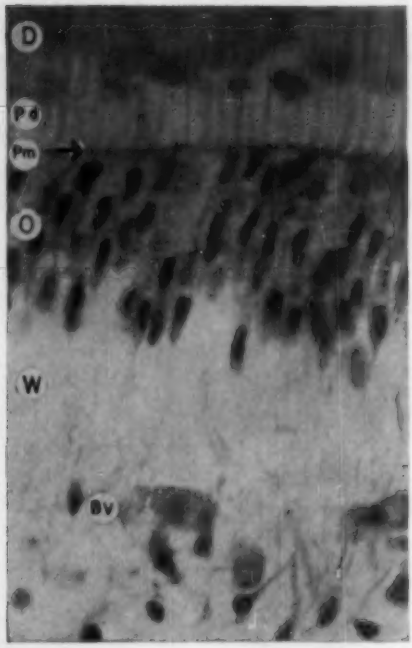

Fig. 1 • Control area in pulp of tooth extracted 25 days after experiment. D, dentin; Pd, predentin; Pm, pulpodentinal membrane; O, mature odontoblasts; W, cell-free zone of Weil; BV, blood vessels. Stained with hematoxylin and eosin

distinct, but in some instances lateral branchings of the cytoplasm could be observed.

A few capillaries coursed between the odontoblasts and between the odontoblasts and the predentin. In sections impregnated with silver, coarse, black, corkscrewlike bundles of Korff's fibers were situated between the odontoblasts (Fig. 2).

The cell-poor zone, situated beneath the odontoblastic layer (Fig. 1 and 2), showed in silver-impregnated specimens a fine meshwork of reticular fibrils which joined to form Korff's fibers. The width of this zone varied from 21 microns to 42 microns.

Below the cell-poor zone, the pulp consisted of a large number of young and old fibroblasts (Table 2). Histiocytes and undifferentiated mesenchymal cells frequently accompanied the capillaries. The intercellular substance consisted of fine fibers, which were argyrophilic, and a cementing substance. The blood vessels had a relatively thin wall and a wide lumen.

Changes in Pulp Following Fillings with Gutta-Percha • No significant differences were observed between the effects of air-brasive and rotary types of preparation. There was no correlation with age and sex. The effects were essentially the same within the range of the depths of the cavities (2 to 4 mm. of remaining dentin). For these reasons the experimental changes are described according to the duration of the experimental period (Table 1).

3 Hour Period • The two specimens extracted 3 hours after the experimental procedure showed an interruption of the pulpodentinal membrane in the area corresponding to the cavity preparations. The number of odontoblasts appeared to be reduced (Fig. 3). The Korff's fibers also were reduced in number and length and were less regular in arrangement. There was edema both in the odontoblastic layer and in Weil's layer. The blood vessels showed slight dilation and contained a larger than normal number of neutrophil leukocytes. The layer of Weil, which is usually free of cells, was invaded by young fibroblasts and cells of a new type which differed from the young fibroblast in size and nuclear structure (Fig. 3). The new cells were characterized by their staining reaction and their nucleus. Their cytoplasm stained slightly pink with eosin and slightly blue with Mallory's dye and was indistinct in outline. These cells had an oval nucleus, measuring approximately 14 by 18 microns, which contained fine chromatin

granules and distinct nucleoli (Table 2). The nuclear membrane was strongly basophilic. The term "pre-odontoblasts" is used to denote these cells.

24 Hour Period • The following additional changes were apparent in the specimen extracted 24 hours after the cavity preparation: The odontoblastic processes nearest the predentin showed a granular cytoplasm. This characteristic change could be observed up to 24 days after the beginning of the experiment. The edema had increased in severity. The cell-poor zone continued to be invaded by cells, mostly "pre-odontoblasts" and fibroblasts. Deeper in the pulpal tissues, hemorrhage occurred, and macrophages and neutrophil leukocytes were present.

3 and 7 Day Periods • In the specimens extracted 3 to 7 days after the cavity preparation neutrophil leukocytes had migrated into the odontoblastic layer and into the dentinal tubules in large numbers. "Pre-odontoblasts" also entered the odontoblastic layer.

11 to 14 Day Periods • In the specimens extracted during the second week, the most characteristic change was observed in the outline of the predentin, which appeared jagged and formed irregular projections. In the silver-impregnated specimens the pattern of the fibrils in the irregular projecting dentin formed a matted mass or extended from the Korff's fibers in a vertical direction rather than in the normal horizontal pattern (Fig. 4). Most of the cells in the odontoblastic layer were "pre-odontoblasts" (Fig. 5, above). At this period lymphocytes and eosinophil leukocytes also began to appear in the odontoblastic and cell-

Table 2 • Morphological characteristics of pulpal cells in 38 human teeth filled with baseplate gutta-percha

Cell	Cell body		Nucleus						Processes	
	Shape	Stain-H & E	Shape	Position	Height	Width	Nucleoli	Stain-H & E	Number	Position
Mature* odont.	Oval (8-12 microns by 20-28 microns)	Slightly basophilic	Oval	Basal part of cell	10 microns	5 microns	Not apparent	Strongly basophilic	Many 1 or 2	Lateral dentinal
Young odont.	Pear	Moderately basophilic	Round	Basal	10-12 microns	7-9 microns	1 or 2	Moderately basophilic	1	Dentinal
Pre-odont.	—	Indistinct	Round	Center	18 microns	14 microns	1 or 2	Slightly basophilic with fine chr. granules		Indistinct
Undif. mesen.	Oval	Indistinct	Oval	Center	12 microns	5 microns	Not apparent	Slightly basophilic and fine chr. granules		Indistinct
Mature fibro-blasts	Fusiform	Moderately basophilic	Oval	Center	14 microns	5 microns	Not apparent	Moderately basophilic	Many	All over
Young fibro-blasts	Fusiform	Indistinct	Oval	Center	16 microns	10 microns	1 or 2	Slightly basophilic & granular		Indistinct

*Only the cell outlines of mature odontoblasts are distinct enough to be measured accurately; therefore, the measurements of other types of cells are approximations.

free layer. Cystlike areas were seen in the experimental pulpal area in 3 of the 9 teeth, in 2 of which there was hemorrhage also. These two were the only teeth of the entire study in which cystlike cavities and hemorrhage appeared together.

17 and 21 Day Periods • In the specimens extracted between 2 and 3 weeks after the cavity preparation, the layer of irregular dentin had increased in thickness. Since this newly deposited experimental dentin represents a reparative process, it is referred to as "reparative dentin," to distinguish it from the more general term of secondary dentin.

Concurrently, a new type of cell appeared in the odontoblastic layer. It was characterized by a slightly basophilic cytoplasm, an indistinct cell membrane and occasional cytoplasmic processes (Fig. 6, below left).

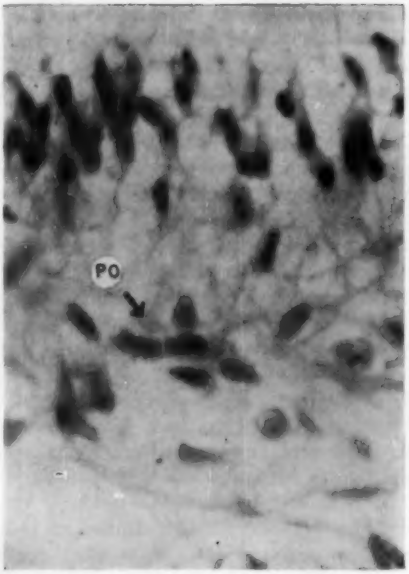

Fig. 3 • Pulp beneath cavity in tooth extracted 3 hours after experiment. Note interrupted pulpodentinal membrane, edematous areas and nuclei of "pre-odontoblasts," Po, in layer of Weil. Stained with hematoxylin and eosin

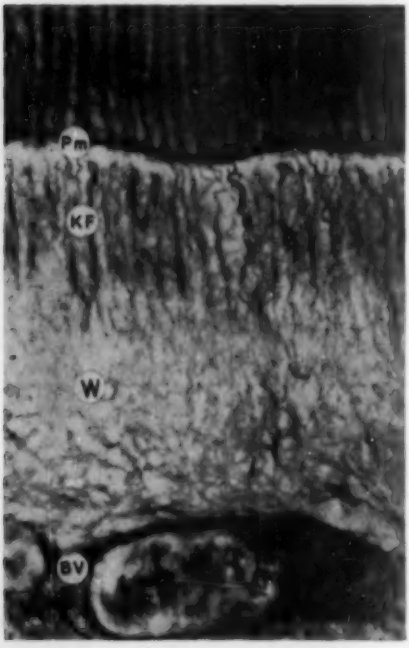

Fig. 2 • Control area in pulp of tooth extracted 14 days after experiment. Pm, pulpodentinal membrane; KF, Korff's fibers; W, cell-free zone of Weil; BV, blood vessels. Silver-impregnated specimen

The nuclei averaged 7 by 12 microns (Table 2), and the chromatin substance was more densely arranged than the "pre-odontoblasts" but not as densely as the mature odontoblasts. Nucleoli could be distinguished but not as clearly as in the "pre-odontoblasts." The term "young odontoblasts" is used to denote these cells. Neutrophil and eosinophil leukocytes could be seen in only 2 of the 7 teeth, and plasma cells appeared in 5 of the teeth. In 3 of the teeth there were signs of hemorrhage, and 3 others had cystlike cavities in the pulp.

24 to 28 Day Periods • In the specimens extracted during the period of 3

and 4 weeks after the cavity preparation, the pulpodentinal membrane appeared to be restored in areas. Granules were no longer seen in the odontoblastic processes. Most of the cells in the odontoblastic layer were "young odontoblasts" (Fig. 5, below). Korff's fibers were more regularly arranged; however, eosinophil leukocytes and lymphocytes still persisted in the pulp tissues (Fig. 6, above). The only indication of a calciotraumatic response occurred in this group, and in only 1 case was there a typical calciotraumatic line. Of the 7 teeth of this group, only 1 tooth showed signs of hemorrhage, and 2 others had cystlike cavities.

35 and 36 Day Periods • In the specimens extracted after 35 and 36 days reparative dentin appeared only in a limited amount. The layer of predentin appeared narrower than normal. The pulpodentinal membrane, which was broken as early as 3 hours after the experimental procedure, was still broken in 4 out of 5 teeth. Eosinophil leukocytes were no longer observed, but macrophages and lymphocytes still persisted (Fig. 6, below right). Three of the teeth showed signs of hemorrhage, and the other 2 had cystlike cavities.

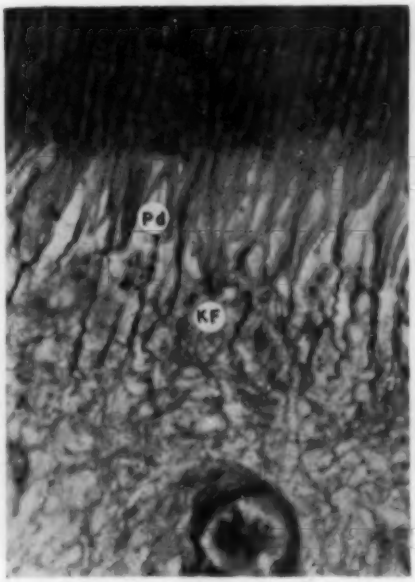

Fig. 4 • Pulp beneath cavity of tooth extracted 14 days after experiment. Pd, irregular projections of predentin; fibrils extending from Korff's fibers, KF, into predentin in vertical direction in contrast to horizontal direction of normal areas as seen in Figure 2. Silver-impregnated specimen

DISCUSSION

Sequela of Changes in Pulpal Tissues • As a result of the cavity preparation and the insertion of baseplate gutta-percha, the odontoblastic processes were injured as evidenced by the appearance of cytoplasmic granules. Some of the odontoblasts apparently had degenerated as evidenced by their reduction in number and their disarrangement. The result was the disorganization of Korff's fibers and the disruption of the pulpodentinal membrane (Table 1).

The degeneration of cells caused an inflammatory reaction of the pulp, which was first of an acute and later of a chronic type. Up to 11 days, the characteristic reaction consisted of hyperemia and migration and margination of neutrophil leukocytes. Although macrophages appeared as early as 24 hours after the experimental procedure, they were still apparent in the later stages in which lymphocytes and plasma cells predominated.

Concomitant with the inflammatory changes, reparatory processes were evident. The so-called cell-poor zone, that is, the layer of Weil, was invaded by fibroblasts and the "pre-odontoblasts." This new type of cell differed from the mature and the young fibroblast as well as from the mature odontoblast (Table 2). These new cells migrated into the odontoblastic layer after the eleventh day and were still present in the fifth week of the experiment. A second new type of cell

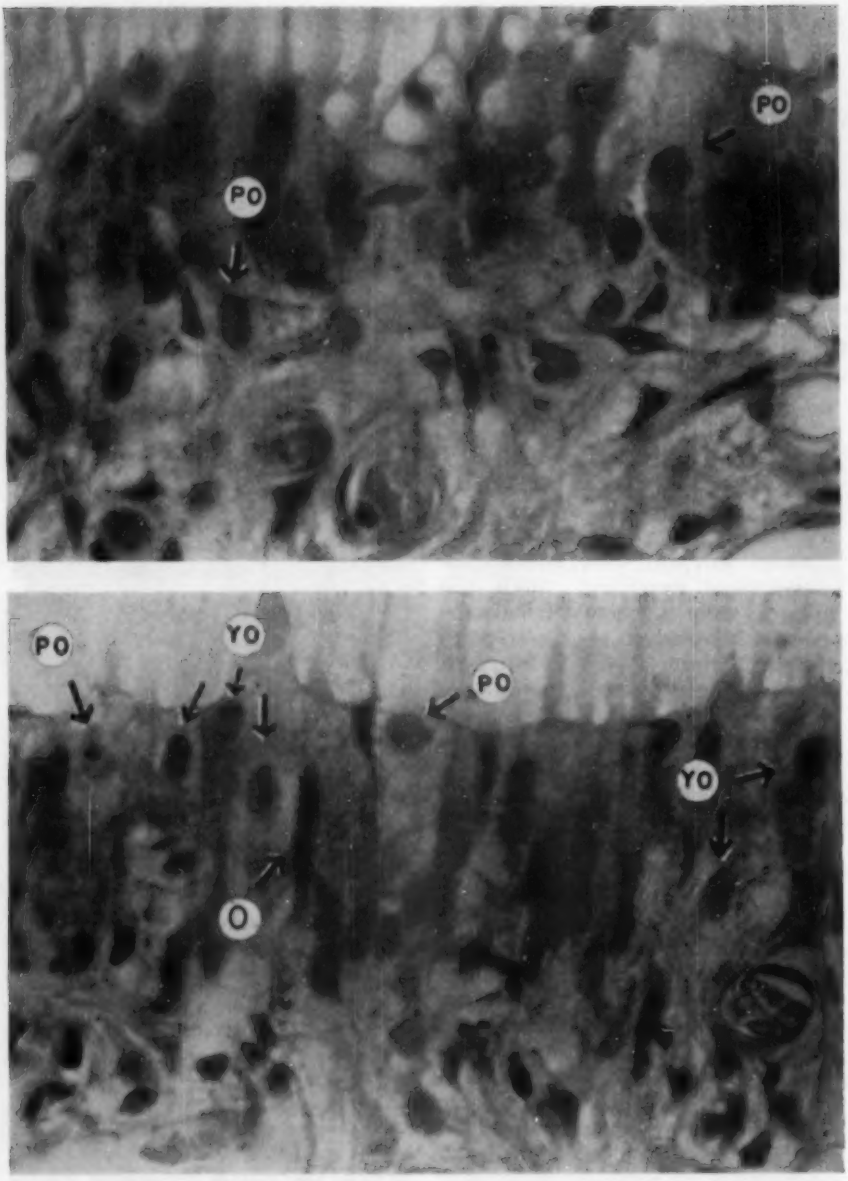

Fig. 5 • Above: Pulp beneath cavity of tooth extracted 11 days after experiment. Note "pre-odontoblasts," Po, in odontoblastic layer and infiltration of cells in subodontoblastic layer in contrast to Figure 1. Stained with hematoxylin and eosin. Below: Pulp beneath cavity of tooth extracted 25 days after experiment. Note "pre-odontoblasts," Po; young odontoblasts, Yo; mature odontoblasts, O, in odontoblastic layer, and continued invasion of subodontoblastic layer by pulpal cells. Stained with hematoxylin and eosin

could be observed from the third week on, in a number of instances, in the odontoblastic layer (Table 2). It apparently represented an intermediate stage between the "pre-odontoblasts" and the mature odontoblasts and, therefore, was designated as the "young odontoblast." It is interesting that Paul[7] as early as 1899 described younger odontoblasts in a similar manner in the normal development of dentin.

The appearance of cells of these types represents an effort for repair and replacement of the odontoblasts which were injured and degenerated as a result of the operative procedures and filling materials. These cells are probably of the same types as those that are normally active in the early development of dentin at the tooth germ stage.[7-10] Similar stages of differentiation of odontoblasts have apparently been observed by Erausquin.[11] Figure 7 is a diagram of the nuclear changes observed in the differentiation of "pre-odontoblasts" to the mature odontoblasts.

Incomplete Process of Pulp Repair • The repair process was only incompletely accomplished in this experiment. There were irregular, conelike projections of dentin lining the affected region of the dentin toward the pulp, with an accompanying irregular distribution of Korff's fibers (Fig. 4).

A moderate amount of reparative dentin had been formed in 5 of the 19 teeth which were extracted 17 to 36 days after the experimental procedure.

Absence of Calciotraumatic Reaction • It is surprising that the calciotraumatic line in the dentin, which is a common reaction following various injuries of the odontoblasts,[12] was not noticed in this experiment except in a single instance. At present there seems to be no explanation for the general absence of the typical calciotraumatic response sometimes referred to as calcific barrier.

Comparison of Pulpal Response to Baseplate Gutta-Percha, to Acrylic Resins and to Other Filling Materials • In spite of a considerable number of histological investigations on the response of the pulp to different filling materials, it is difficult to make an accurate comparison. The reason lies in the fact that the experimental procedures have varied widely and that the criteria of evaluation employed by the various investigators have been insufficiently objective and quantitative. Nevertheless, there is general agreement that silicate and particularly copper cements produce the most severe alterations and that the use of zinc oxide and eugenol results in the least alterations.

Kramer and McLean[13] were among the first to use a quantitative evaluation of the pulpal changes in response to filling materials, particularly acrylic resins. A comparison of the findings in this investigation with theirs, on the basis of their criteria, suggests that restorations with baseplate gutta-percha result in a more severe pulpal response than do fillings with acrylic resins.

It is anticipated that future investigations will lead to further improvement and to more precise standards of evaluation which will permit a more accurate comparison of the effects of different fillings and of the results of different investigators.

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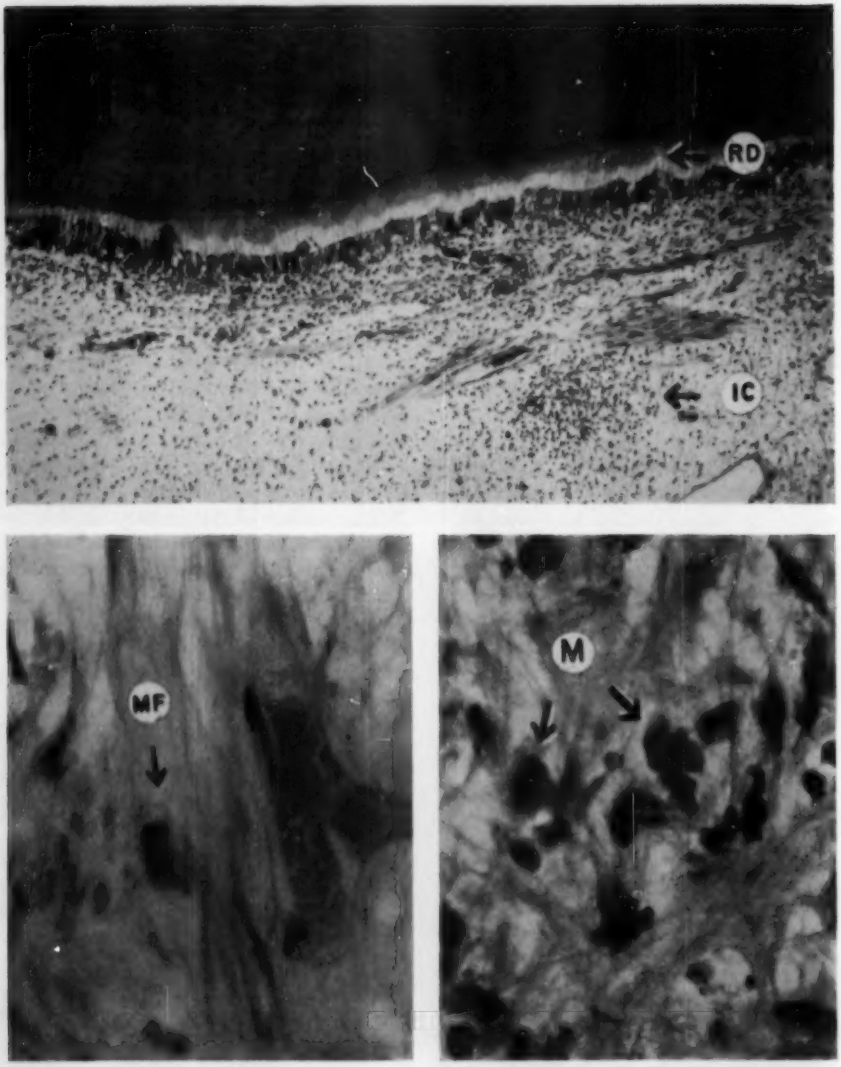

Fig. 6 • Above: Dentin and pulp beneath cavity of tooth extracted 25 days after experiment. RD, reparative dentin; IC, inflammatory cells. Stained with hematoxylin and eosin. Below left: Pulp beneath cavity in area below Weil's layer of tooth extracted 17 days after experiment. MF, mitotic figure, probably of a histiocyte, as evidenced by granules in cytoplasm. Stained with hematoxylin and eosin. Below right: Pulp tissue beneath cavity of tooth extracted 35 days after experiment. M, macrophages. Stained with hematoxylin and eosin

Possible Role of Operative Procedures in Cavity Preparation and Sealing of Cavity • On the basis of the present study, it is not possible to decide to what extent the experimental changes are related to cavity preparation, imperfect sealing or pressure or heat in the application of the filling material.

Kramer and McLean[13] in a careful and comprehensive investigation reported no pulp reaction in the majority of their experiments with zinc oxide and eugenol even in cavities which were as close as ½ mm. from the pulp. On the basis of these findings, they concluded that the pulpal changes were primarily the result of the filling material. Manley[14] also came to a similar conclusion. It seems, however, that there still remains the possibility, as suggested by Shroff,[15] that irritation of the pulp may have resulted from the preparation of the cavity and from possible salivary contamination but was counteracted by a mollifying and healing effect of the zinc oxide and eugenol.

Experiments should be designed to study the effects of cavity preparation alone. Such experiments would require the preparation of cavities which are protected against ingress of saliva and hermetically covered on the surface without any filling.

Clinical Considerations • In view of the persistence of an inflammatory reaction of the pulp for 36 days, the time limit of this experiment, there is a likelihood that at the time a permanent filling material is inserted after a temporary restoration with baseplate gutta-percha the pulp may already be inflamed. This inflammation may be associated with increased sensitivity, a clinical experience which is not uncommon after gutta-percha fillings. Orban and Ritchey,[16] however, have shown that a pulp which in microscopic studies shows signs of inflammation may not necessarily cause clinical symptoms except under special strains as, for example, in high altitude flights.

Fig. 7 • Types of nuclei in odontoblastic cells. Left, preodontoblast; center, young odontoblast; right, mature odontoblast

Since there is consistent agreement in the literature that zinc oxide and eugenol is not injurious to the pulp, it should be used wherever possible in preference to baseplate gutta-percha until a better temporary filling material becomes available.

It must be pointed out that the pulpal alterations observed in noncarious teeth in this investigation were probably more severe than such changes would be in teeth which previously had been attacked by caries and had the protection of reparative dentin.

SUMMARY AND CONCLUSIONS

This study is based on the histological investigation of 36 human teeth in which labiogingival cavities were prepared by a bur technic or by an airbrasive technic. Baseplate gutta-percha was placed in the cavities, and the teeth were extracted for orthodontic reasons after varying periods of time from 3 hours to 36 days.

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The pulpal response was essentially the same for preparations by the bur technics and the airbrasive technic and could be classified as in a defensive and a reparative phase.

The characteristic experimental changes consisted of a decrease in the number of mature odontoblasts, a break in the continuity of the pulpodentinal membrane and a cellular invasion of the layer of Weil. The pulp showed an inflammatory response that changed from an acute to a chronic type. Attempts at repair were indicated by the replacement of odontoblasts by "pre-odontoblasts" and "young odontoblasts" and the formation of a relatively thin layer of "reparative" dentin. Even after 36 days chronic inflammation still persisted.

The pulp under cavities prepared and temporarily filled with baseplate guttapercha is already an inflamed pulp when the subsequent permanent filling material is placed.

This investigation may pave the way for more objective histological criteria for the evaluation of the pulpal response to filling materials.

Efficiency of high operating speeds with water lubrication in cavity preparation

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The advantages that can be gained by changing from operating at standard speeds, with a maximum of 4,500 rpm, to operating at speeds up to 13,000 rpm cannot be appreciated readily; therefore, except for a limited number of enterprising individuals, this improvement in operating technic has not been generally accepted by practitioners. Many dentists fear that the teeth and surrounding tissues may be injured more readily when cutting instruments revolving at higher speeds are used than when conventional speeds are used. To allay these fears and demonstrate that the use of high speeds is practical, the U.S. Army, through the Medical Research and Development Board, conducted an extensive clinical trial using the equipment now available to the Army, except that a water spray was attached to the handpiece.

This program in the Army dental service was pioneered in 1946 by Colonel Carlos F. Schuessler, USAF,DC, who initiated tests on the temperature rise and the efficiency of burs cutting at various speeds. These tests proved that high speed in dental cutting technics increased cutting efficiency. Also, a motor handpiece combination was developed that utilized speeds up to 20,000 rpm. The principles involved in high speed drilling technics can be adapted for use by the

The tests, performed to establish the conclusions presented in this article, were under the direction of the Medical Research and Development Board, U.S. Office of the Surgeon General, U.S. Army.

*Deceased.

majority of practicing dentists, and only slight alteration of their present dental equipment would be needed.

A preliminary test on the use of high speeds was conducted at the Scott Air Force Base in Illinois. The dental section of the Base Medical Maintenance Shop of the St. Louis Medical Depot modified the test motors so that they would operate at 8,500 rpm. The results of this test, in which carbide burs were used, showed a definite increase in the efficiency of cavity preparation without an increase in discomfort to the patient.

The Ritter Company then ran a test on the ability of their motors to tolerate, for many months of continuous operation, speeds up to 13,000 rpm. The results of the Ritter test showed that their motors would stand these speeds with only additional bearing and brush wear. This wear was no more than would occur in the bearings and brushes when operated in equal revolutions at lower speeds.

The Weber and S. S. White Companies also have run tests and have given assurance that their motors will tolerate the increased speed. This, of course, would not apply to motors of ancient vintage which have a mica instead of a plastic insulation between the poles of the commutator.

CONVERSION OF DENTAL UNIT

The conversion of the present dental unit motor so that it will operate at from 9,000 to 11,000 rpm in the high forward speed position of the foot controller is simple. All that is necessary to accomplish this is to disconnect one wire leading to the porcelain tubelike resistors which are in the chassis of the dental unit. The resistors, which are used to control the three lower speeds and the reverse speeds, are in the foot control box.

The resistors are porcelain tubes about four inches long and are either light green or white in color. For the Weber unit, the disconnection can be made on the terminal strip (the wire no. 29 is disconnected on the Weber Model "H-military"), and on other Weber models and S.S. White and Ritter units, the disconnection is made at the resistors.

In order to disconnect these resistors, only one lead-in wire needs to be bolted. If it is desired, a toggle switch (Fig. 1) may be placed in this line and positioned at a convenient spot on the unit so that the dentist will have the flexibility of using five instead of four forward speeds.

Dental motors are all series wound to make them stop effectively when the current is cut off. The suggested change does not affect the automatic braking of the motor, and the disconnecting of the high forward speed resistors in the chassis of the unit does not increase appreciably the three lower speeds or affect the reverse speeds. The local dental equipment maintenance man can make all of these changes.

CARE OF UNIT

The motor must be lubricated, but not too often or too much, and the commutator must be kept clean, and the brushes must be watched in order to be sure that they do not wear down too far. The motor should be checked and lubricated at least once a month; the commutator can be cleaned with a lightly oiled cloth. The brushes should be replaced when worn to a quarter of an inch of effective carbon.

It is recommended that a driving pulley having a diameter larger than the conventional ones be installed. This will reduce belt slippage and increase the speed of the handpiece. In addition, and even more important, the engine belt must be loosened until the handpiece pulley can be felt to be turning over at the highest rpm. Another method of determining the highest rpm is to loosen the belt until the highest pitched sound is heard when the contra-angle handpiece is held close to

the ear. The belt guide wheels on the arm must be cleaned and lubricated with a light oil at least once a week. Carbon tetrachloride must not be used as a cleaner because it has a tendency to corrode the metal.

If all the alterations and adjustments previously outlined have been made but the straight and contra-angle handpieces are not properly adjusted and maintained, the whole procedure is useless. At 10,000 rpm, the bearings of the contra-angle handpiece are rotating at roughly the same speed as the wheel bearings of an automobile traveling at 800 miles an hour. In an average day's dental operation, the rotation of the bearing is equal to that in an automobile traveling at a speed of 800 miles per hour for the distance between St. Louis and Los Angeles. The only way the handpiece, particularly the contra-angle one, can withstand this speed is by adequate care. The manufacturer's instructions for the proper care of handpieces accompany each instrument. These instructions frequently are thrown away without having been read or complied with, and yet the operator expects that the bearings and gears will give good service. These bearings are steel working against steel; they wear very fast without oil. Grindings from the teeth and fillings and abrasive dust get into the bearings and contribute to abnormal wear. Adequate handpiece care cannot be overemphasized; for the contra-angle handpiece this should be at least twice daily.

The close tolerances adhered to in the construction of dental handpieces make it imperative that light oil be used for lubrication. For quick yet routine cleaning and lubricating of latch-type angle handpieces, the oil hole found under the latch should be opened and cleaned with a pipe cleaner, the handpiece should be ro-

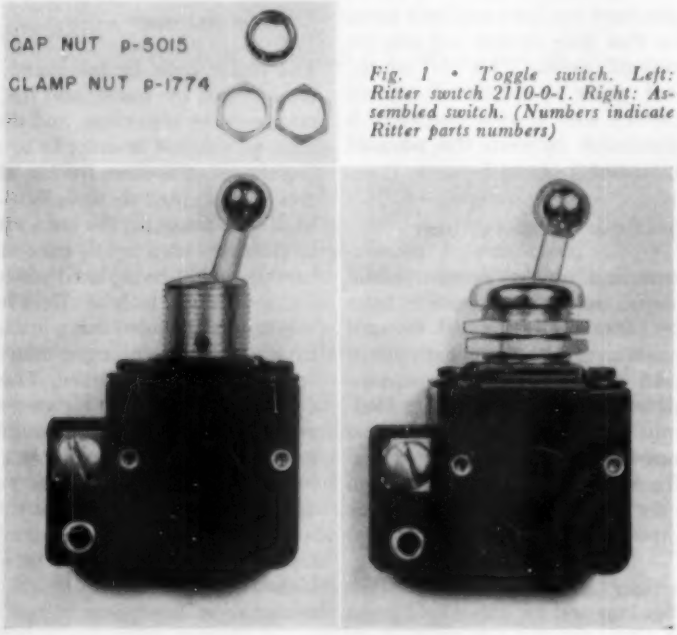

Fig. 1 • Toggle switch. Left: Ritter switch 2110-0-1. Right: Assembled switch. (Numbers indicate Ritter parts numbers)

tated in a cleaner alternately forward and reverse for two minutes, then it should be removed and rotated out of the cleaner. Finally it should be rotated in light oil for a half minute. A more thorough cleaning, oiling and adjustment should be done at least once a week.

The straight handpiece should be adjusted closely so that the bearing in the nose of the handpiece is functioning as well as the bearing in the yoke. This can be done by tightening the sheath snugly, then tightening the rotating inner drive spindle until it engages the sheath. The spindle is then backed off approximately a quarter to a half of a turn, or just enough to give clearance to the nose bearing so that the oil will be able to lubricate and not be thrown out by excess vibration when this bearing is too loose. A properly adjusted and lubricated bearing will create less heat and, of course, less vibration.

TEST

In order to determine the comparative effectiveness of using conventional motor speeds without a water spray and accelerated motor speeds with a water spray in the preparation of cavities, the Army conducted the following test.

Ten dentists at Fort Belvoir, Va., were divided into two teams. Previous clinical records showed that the young dentists selected were close enough in operating skill to be considered operationally equal. The equipment, instruments and supplies, including burs, stones and diamonds, were general Army issue. In addition to this equipment, when higher speeds were used, a water spray was attached to the handpiece. During the test 2,080 cavities involving 3,003 surfaces were prepared (table). A saving in time of one minute per surface was achieved by the use of high speed with water spray (Fig. 2).

It is possible to use the present Army straight and contra-angle handpiece at high speed without undue damage if given proper care. The old type of Army standard contra-angle handpiece with very small bearings will, of course, wear faster with increased rpm. It was suggested by the dentists making the tests that straight and contra-angle handpieces used at high speed be those of the same manufacturer, and that the new, long bearing contra-angle handpieces be used.

Table • Number of cavities prepared

	High speed with water spray	Standard speed without water spray
Total cavities	1,173	907
One surface	758	654
Two surface	329	184
Three surface	86	69
Total surfaces	1,674	1,329
Anesthetics	158	264
Time in minutes	6,300	6,660
Time/surface	3.9 min.	5 min.

OBSERVATIONS

The operators believed that the patients had less pain when enamel was cut with instruments operated at high speeds under a water spray than when the instruments were operated at conventional speeds without the benefit of the water spray. They were in agreement that the decrease in time of cavity preparation shortened the duration of pain and left a good impression on the patient. When dentin was reached, the operators preferred using a standard speed.

One objection to the use of high speed was that the water spray was cold after traveling under pressure and coming out as fine spray. A procedure to eliminate this objection is being studied. When warm water was used, this objection was eliminated.

The clogging of the burs with debris (Fig. 3) decreased the cutting efficiency and increased the frictional heat. Obviously, the friction caused in cutting would vastly increase as each tooth of

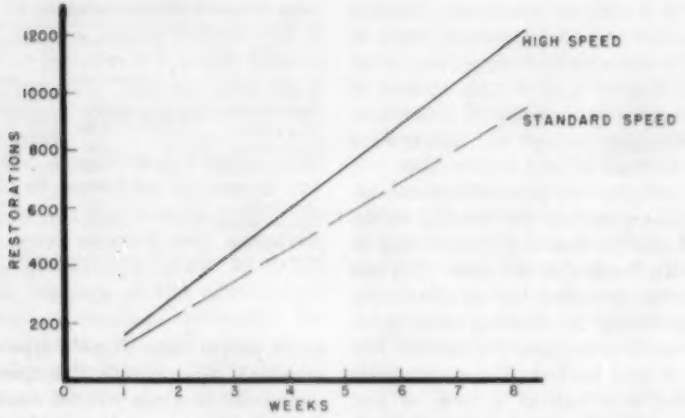

Fig. 2 • Number of restorations inserted by an equal number of operators in an equal given time using high speed with water spray and standard speed without water spray

the bur becomes clogged. There are two methods for eliminating this clogging when using the burs presently available on the market: (1) The speed can be increased and the pressure of the cutting can be decreased so that the chips taken off at each revolution will be smaller and will be thrown out with the increased rpm of the operation. (2) A spray of water can be used under pressure to wash the bur continually as it rotates. If these methods are used, the bur will be conserved, and the amount of pain caused by the use of rotating cutting instruments in cavity preparation will be decreased.

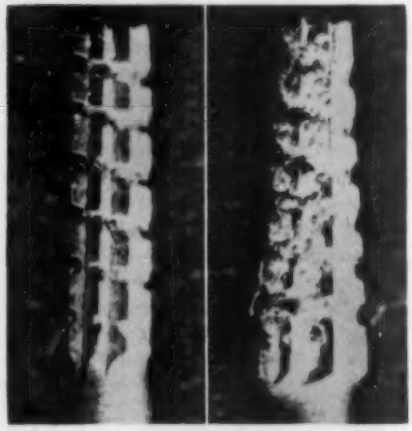

Fig. 3 • Cross-cut fissure burs. One at left used at high speed with water spray; lack of clogging of bur can be seen. The one at the right was used at low speed without water spray; clogging of flutes of bur can be seen

On completion of the test, it was found that the operators using standard speed without water spray had used a considerably larger number of burs than those who used high speed with water spray (Fig. 4). Of course, diamond coated instruments were used more frequently at high speed than at standard speed; the choice, however, was left entirely up to the operator. Since an equal number of steel burs and diamond coated instruments were available, it can be assumed that the operators found diamond coated instruments more efficient at high speed than steel burs, whereas operators using standard speeds preferred

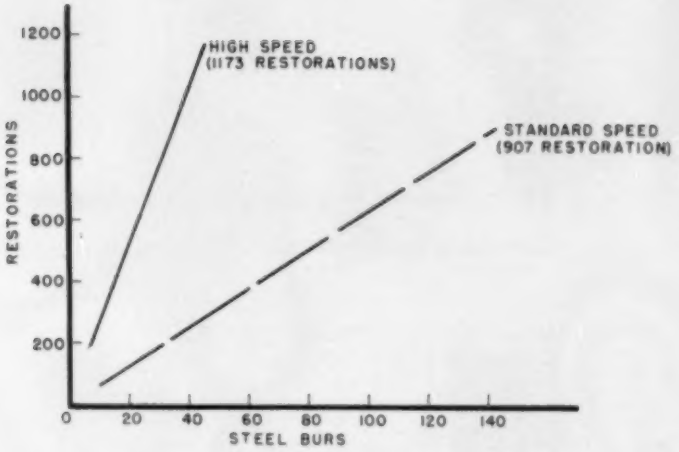

Fig. 4 • Number of burs used at high speed with water spray and at standard speed without water spray

the steel burs. After the test was completed, it was found that the steel burs used at high speed with water spray were much cleaner and in better condition. The number of steel burs discarded at high speed with water spray was less than a quarter the number discarded at standard speed. The wear on the diamond coated instruments was found to be less when used at high speed with a water spray, although undoubtedly they were used a great deal more at high speed than at standard speed.

The two dental officers in charge of the teams stated that when high speed with water spray was used, the task was accomplished with less physical effort on the part of the operator. Without exception, the officers who left the clinic, either to return to private practice or because of a change in assignment, have requested and received individual instruction on how to change the equipment from standard to high speed. High speed is now used exclusively in the entire clinic. In a short time the entire Army will have its equipment converted so as to make high speed possible.

SUMMARY

From the data obtained in a study of the comparative effectiveness of using conventional motor speeds without a water spray and accelerated motor speeds with a water spray in the preparation of cavities, it was shown that cavities can be prepared more rapidly when high speed with the spray is used than when standard speed without the spray is used. The patient's reaction is favorable because of the decrease in chair time; also, the fatigue of the dentist is less when he is operating at high speed. An equal number of clinicians operating an equal number of hours will produce more restorations at high speed.

The cost per unit of work declines with the use of high speed. The present Army dental equipment, with proper care, can be converted and utilized in high speed operating technic. The individual dentist can gain over a period of a year, the equivalent of two weeks additional operating time by changing from standard to the higher speeds available to him with his present dental equipment.

The influence of generalized diseases on clinical manifestations of periodontal disease

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Comprehensive reviews of the literature by Karshan[1] and Mitchell and Helman[2] emphasize the influence of generalized diseases on periodontal health. It has been reported that blood dyscrasias,[3,4] endocrine dysfunctions,[5] pregnancy,[6] diabetes,[7,8] nutritional deficiencies[9,10] and various debilitating diseases[11] adversely affect the metabolism of periodontal tissues and thereby contribute to the development of periodontal disease.

The evaluating committee reporting on systemic factors in periodontal disease at the 1951 workshop, conducted by the School of Public Health and the School of Dentistry, University of Michigan, summarized present-day opinion on the subject as follows: "It can be stated safely that in every individual systemic factors influence the initiation and the course of periodontal disease and the maintenance of periodontal health."[12] Periodontal lesions, however, occur also in many people with no clinical evidence of generalized disease; therefore, local dysfunctional and irritational factors may be of equal or greater influence in the initiation and development of periodontal disease.

If systemic factors predispose to the development of periodontal lesions, there should be epidemiological evidence to support this hypothesis. Persons who suffer from wasting nutritional or chronic debilitating diseases should have more frequent or more extensive lesions than those who seem to be in fairly good health. The few published epidemiological studies differ so widely in their criteria and methodology that they are of little value for comparisons.[13-17] Nevertheless, it is

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12. Report of evaluating committee III: Systemic factors in periodontal disease. J.A.D.A. 45:21 July 1952.

evident from these reports that periodontal disease is widespread not only in the United States but in many other countries.[18-20] As yet, few studies have measured the degree of involvement or its relationship to specific generalized diseases.

SAMPLE AND METHOD OF EXAMINATION

The wide variation in periodontal disease experience makes it difficult to determine whether the periodontal involvement in any individual is greater than might be expected in the general population; but averages of large groups similar in age and in most other respects can be expected to conform to a normal distribution and to be governed by the laws of chance. It was planned therefore to measure the degree of periodontal involvement in a large number of hospitalized veterans and to determine whether specific generalized diseases are associated with increased periodontal experience.

It is routine procedure at the Brooklyn Veterans Administration hospital to schedule every patient for dental clinical and roentgenographic examination, usually on the day after admission or as soon thereafter as possible. A full mouth periapical series, consisting of 14 roentgenograms, is taken unless the patient is edentulous. Occlusal films are taken of the jaws of edentulous patients; and when indicated, lateral jaw films or head films also are taken.

On the day after the roengenographic examination, or as soon thereafter as possible, the patient is examined in the dental clinic, where the mounted roentgenograms and other diagnostic aids are available. A Type 1 examination is then completed. This consists of a complete examination of the oral tissues and structures with a mouth mirror, an explorer and adequate illumination; a thorough roentgenographic survey; and, when indicated, palpation, percussion and pulp vitality tests; transillumination; analysis of study models; and laboratory tests.

For purposes of this study all patients who had had a complete dental examination were re-examined by a periodontist (S.S.S.) two or three days after the regular dental examination. The periodontal observations were verified or corrected and recorded separately for every tooth. All missing teeth and other pertinent data also were recorded.

The following patients were not included in this study: patients who were critically ill; patients who had acute contagious diseases; those who were in the hospital for only a few days and who could not be reached for dental examination; tubercular patients, who have their own dental clinic and dental service; a few negro patients—their number was considered too small for purposes of analysis; a few women patients, whose number likewise was too small for analysis; patients with less than five teeth, since they provide poor data for evaluation and comparison; and all edentulous patients.

The sample, accordingly, consisted of all white, male patients admitted to the hospital who could be examined in the dental clinic. These constituted a little over 50 per cent of all patients admitted during the period of the study.

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CLASSIFICATION OF MOST SIGNIFICANT GENERALIZED DISEASE

The disease for which a patient is hospitalized is not always the disease of greatest significance. It was necessary, therefore, to study each patient's hospital record, medical history, record of physical examination, record of previous hospitalization and present diagnoses. If multiple diagnoses or a complicated history did not permit a clear-cut classification, the selection of the most significant systemic disease was made according to the order of importance established by the final diagnosis (Table 1).

Patients who had been hospitalized for uncomplicated conditions, such as hernia, hemorrhoids, fistula in ano, acute infections, elective operations, amputations, "low back" syndrome and neuropsychiatric, traumatic and orthopedic conditions, were used as a control group. If later any were found to have had a previous history of a generalized disease, such as diabetes or cardiovascular disease, they were classified in the corresponding specific disease groups.

MEASUREMENTS OF PERIODONTAL DISEASE

No one measurement of periodontal disease can take into consideration all variables involved. The PMA index[17] is useful for surveys of gingival inflammatory symptoms in children; but it has limited value in the study of older persons,[21] who frequently have chronic degenerative symptoms.

Four specific clinical manifestations of periodontal disease were recorded for each tooth: (1) inflammation of the mesial gingival papilla, (2) inflammation of the marginal gingivae, (3) recession of the marginal gingivae from normal contour and (4) degree of resorption of alveolar bone as determined from roentgenograms and clinical examination.

Gingival inflammation and recession are self-descriptive, but the alveolar bone resorption score used in this study requires definition. While gingival symp-

21. Sendler, Henry C. Testing the uniformity of the P-M-A index as a measurement of periodontal disease. J. D. Res. 31:323 June 1952.

Table 1 • Hospitalized white males with specified diseases, by age groups

Most significant disease or condition	Age group						
	Under 21	21-30	31-40	41-50	51-60	61-70	Total
Control group							
Surgical and other	2	169	158	52	53	19	453
Neuropsychiatric		34	20	3			57
Traumatic	1	15	11	1	3		31
Orthopedic	9	13					22
Total	12	231	189	56	56	19	563
Experimental group							
Endocrine		11	17	5	7		40
Neoplastic		11	24	12	44	24	115
Cardiovascular		14	27	17	64	30	152
Dermatological		34	30	11	5	1	81
Gastrointestinal	1	63	62	20	16	7	169
Liver		3	8	14	11	7	43
Kidney	1	31	25	13	14	2	86
Respiratory	2	12	20	5	7	4	50
Total	4	179	213	97	168	75	736
Total	16	410	402	153	224	94	1,299

toms have certain clinical significance, the degree of bone resorption as seen in roentgenograms and verified clinically is probably the best single measurement of the effect of periodontal disease. Alveolar bone reacts readily to local trauma; its delicate architecture lends itself to roentgenographic survey of early bone changes. Periodontal disease is not the only cause of alveolar crest resorption, but the overwhelming proportion of such bone loss must be attributed to periodontal disease.

The degree of resorption was scored to reflect the state of bone loss in relation to prognosis for treatment. Each tooth was scored according to the amount of alveolar bone resorbed in relation to the total root length as follows:

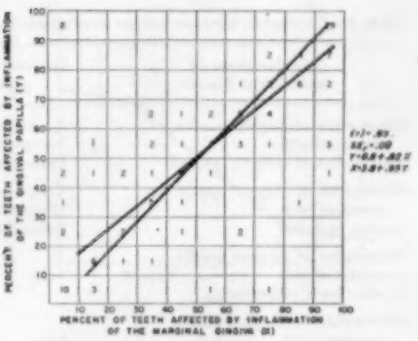
PERCENT OF TEETH AFFECTED BY INFLAMMATION OF THE GINGIVAL PAPILLA (Y)
PERCENT OF TEETH AFFECTED BY INFLAMMATION OF THE MARGINAL GINGIVA (X)

Fig. 1 • Relationship between inflammation of gingival papilla and inflammation of marginal gingiva in patients with neoplasms

0 = Normal: no obvious resorption of bone; lamina dura intact at the crest of the alveolar process.

1 = Alveolar bone resorption not exceeding one third of root length.

2 = Alveolar bone resorption greater than one third but less than one half of root length.

3 = Alveolar bone resorption greater than one half of root length. The prognosis for such teeth is usually poor, and they usually require extraction.

The individual's alveolar bone resorption score is the quotient obtained by dividing the total scores for resorbed alveolar bone by the number of teeth, according to the formula:

$$\text{Alveolar bone resorption score} = \frac{\text{Sum of individual tooth scores}}{\text{Total number of teeth}}$$

The advantages of this score of alveolar bone resorption are as follows: (1) The score has clinical meaning for the practitioner, since it indicates the severity of the lesion and its prognosis. (2) It is objective. (3) It is precise; it defines the degree of resorption in relation to the root length. The measurement in millimeters would have less clinical significance. (4) It provides a check on the roentgenographic record. (5) It represents the entire mouth, giving equal weight to each tooth. (6) Since the scale is continuous from zero to 3.0, it lends itself to statistical calculations.

The disadvantages of this score are as follows: (1) It does not reflect soft tissue changes. (2) The numerical values are indirect. (3) The score does not provide differentiation between the various types of periodontal disease.

PMA RELATIONSHIPS

The statistical relationship, that is, the correlation coefficient, between the occurrence of inflammation of the interdental papillae and inflammation of the marginal gingivae was found to be high. Figure 1 represents the regression of each variable relative to the other. A correlation coefficient of such magnitude ($r = .85 \pm .09$) would seem to signify that when a large proportion of gingival papillae are inflamed, then a large proportion of gingival margins are apt to be inflamed, and when few of either are inflamed, then few of the other will be inflamed. Table 2 lists the correlation

Table 2 • Correlation between various manifestations of periodontal disease

Manifestations of periodontal disease	Systemic disease group	Number of patients	Correlation coefficient (r)	Standard error (SEr)
Inflammation of gingival papilla compared with Inflammation of marginal gingiva	Cardiovascular	152	.89	.08
	Neoplastic	115	.85	.09
	Endocrine	40	.92	.16
Inflammation of gingival papilla compared with gingival recession	Cardiovascular	152	.57	.08
	Neoplastic	115	.66	.09
	Endocrine	40	.55	.16
Inflammation of gingival papilla compared with alveolar bone resorption	Total	1,299	.54	.03
Inflammation of marginal gingiva compared with alveolar bone resorption	Total	1,299	.57	.03
Gingival recession compared with alveolar bone resorption	Total	1,299	.64	.03

coefficients of several disease groups and of the total sample studied.

Gingival inflammation and gingival recession also were found to be directly related, but it was not uncommon to find persons with few inflamed gingivae and many receded gingivae, and vice versa ($r = .55 \pm .16$ to $.66 \pm .09$), as shown in Figure 2. Similarly, the two degenerative symptoms, recession of the gingivae and resorption of the alveolar bone, also are associated; but they do not occur together with sufficient constancy to warrant the reliable prediction of one symptom from the other (Fig. 3).

Inflammatory and degenerative symptoms of periodontal disease are so different in character and incidence that their inclusion into one measurement index obscures the clinical significance of the results. Therefore, each symptom was studied separately.

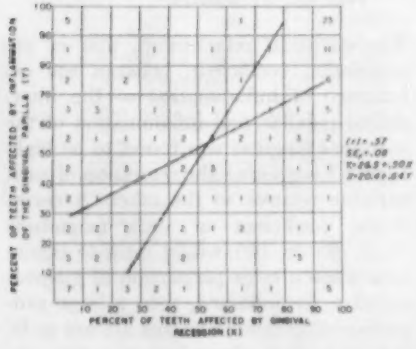

Fig. 2 • Relationship between inflammation of gingival papilla and gingival recession in patients with cardiovascular disease

RESULTS

Number of Teeth • As people grow older, the number of teeth remaining becomes smaller; in this sample the average number of teeth decreased from 26 at ages 21-30 to 18 at ages 61-70 (Fig. 4). Contrary to expectation, in this sample patients with severe debilitating diseases had not lost more teeth on an average than others of the same ages. The average number of teeth did not differ significantly from one specific disease group to another for patients of similar ages (Table 3). This fact tends to increase confidence in the validity of the sample selected and in the comparisons between tooth populations of different disease groups.

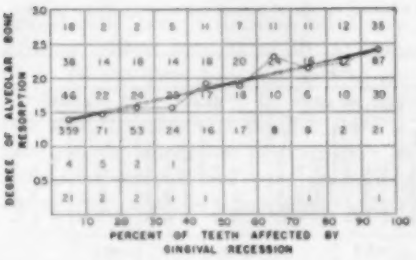

Fig. 3 • Relationship between degree of alveolar resorption and per cent of teeth affected by gingival recession in 1,299 white males

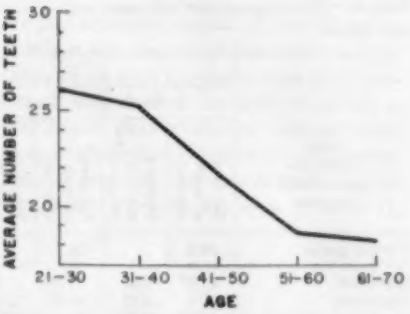

Fig. 4 • Average number of teeth in 1,299 white males, by age

Inflammation of Gingival Papillae • The proportion of inflamed gingival papillae increased with the age group from almost 25 per cent for teeth of patients aged 21-30 to 57.8 per cent for teeth of patients aged 51-60.

When the various disease groups are compared with the control group, it is observed that a significantly greater proportion of papillae were inflamed in persons with the following generalized diseases (Table 4, Fig. 5):

1. Endocrine diseases at ages 21-50.
2. Neoplastic diseases at ages 31-50 and 61-70.
3. Cardiovascular diseases at ages 21-30, 41-50 and 61-70.
4. Dermatological diseases at ages 21-40 and 51-60.
5. Gastrointestinal diseases at ages 21-30 and 61-70.
6. Liver diseases at ages 41-70.
7. Kidney diseases at ages 31-40.

Table 3 • Average number of teeth, by age of patient and generalized disease

Most significant generalized disease	Age														
	21-30			31-40			41-50			51-60			61-70		
	Total number of teeth	Average teeth per patient	Standard error	Total number of teeth	Average teeth per patient	Standard error	Total number of teeth	Average teeth per patient	Standard error	Total number of teeth	Average teeth per patient	Standard error	Total number of teeth	Average teeth per patient	Standard error
Control group	6,348	27.6	0.29	4,858	25.3	0.33	1,316	23.5	0.65	1,150	19.5	0.85	355	18.7	1.51
Endocrine	267	24.3	1.22	409	24.0	1.04	85	17.0	2.14	147	21.0	1.23	—	—	—
Neoplastic	283	25.7	0.98	607	25.3	1.11	230	19.2	1.64	805	18.3	0.93	458	19.0	1.31
Cardiovascular	363	25.9	1.15	605	22.4	1.00	376	22.1	1.47	1,160	18.1	0.86	607	20.2	1.21
Dermatological	884	26.0	0.72	729	24.3	0.99	237	21.6	1.49	108	21.6	3.31	20	20.0	—
Gastrointestinal	1,682	26.7	0.54	1,556	25.1	0.52	360	18.0	1.39	336	21.0	1.40	104	14.8	2.49
Liver	834	27.8	2.64	189	27.8	2.54	260	18.6	1.54	204	18.6	1.76	149	21.2	2.37
Kidney	742	28.2	1.26	690	27.6	0.90	330	25.4	1.69	202	14.4	1.02	27	13.5	—
Respiratory	306	25.2	1.00	504	25.2	0.86	93	18.6	4.13	87	21.7	2.89	95	19.0	2.39
Total	10,709	26.2		10,147	25.2		3,287	21.5		4,199	18.7		1,720	18.3	

Table 4 • Percentage of teeth with mesial gingival papilla inflamed, by age of patient and most significant generalized disease

Most significant generalized disease	Age									
	21-30		31-40		41-50		51-60		61-70	
	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**
Control group	24.8		35.2		45.0		57.8		48.5	
Endocrine	51.4*	3.08	59.1*	2.52	57.0*	5.54	63.6	4.23	—	—
Neoplastic	30.5	2.77	43.8*	2.13	52.5*	3.57	55.0	2.28	70.5*	4.73
Cardiovascular	37.1*	2.57	35.0	2.06	60.9*	2.86	59.4	2.05	65.2*	4.09
Dermatological	30.7*	1.61	48.6*	1.97	34.2	3.52	73.0*	4.51	50.0	—
Gastrointestinal	32.5*	1.21	36.3	1.63	40.6	2.93	61.0	3.03	63.3*	5.32
Liver	25.0	1.56	40.0	3.63	55.8*	3.37	71.4*	3.48	80.7*	5.68
Kidney	26.0	1.67	40.0*	1.99	33.6	2.94	56.4	3.78	—	—
Respiratory	26.9	2.57	40.6*	2.29	41.0	5.28	35.0	5.32	55.0*	2.55

*Significantly greater than the control group of the same age.

**Standard error of difference $= \sqrt{\frac{pq}{n_1} + \frac{pq}{n_2}}$.

8. Respiratory diseases at ages 31-40 and 61-70.

Inflammation of Marginal Gingivae • Inflammation of the marginal gingivae parallels the occurrence of inflamed papillae (Fig. 6). A significantly greater proportion of teeth had inflamed marginal gingivae in persons with the following generalized diseases (Table 5):

1. Endocrine diseases at ages 21-40.
2. Neoplastic diseases at ages 21-40 and 61-70.
3. Cardiovascular diseases at ages 21-50 and 61-70.
4. Dermatological diseases at ages 21-40.
5. Gastrointestinal diseases at ages 21-70.
6. Liver diseases at ages 21-70.
7. Respiratory diseases at ages 61-70.

Recession of Gingivae • Gingival recession increased rapidly with age of patient from 12.6 per cent of teeth at ages 21-30 to 64.9 per cent of teeth at ages 61-70 (Table 6, Fig. 7). The proportion of teeth with recession of the gingivae was significantly greater in persons with the following diseases:

1. Endocrine diseases at ages 21-60.
2. Neoplastic diseases at ages 21-60.
3. Cardiovascular diseases at ages 21-50 and 61-70.
4. Dermatological diseases at ages 21-60.
5. Gastrointestinal diseases at ages 21-60.
6. Liver diseases at ages 21-30 and 41-70.
7. Kidney diseases at ages 21-40 and 51-60.
8. Respiratory diseases at ages 21-50.

Alveolar Bone Resorption • The average alveolar bone resorption score increased with age of patient in all disease groups. In the control group (Table 7) the aver-

age alveolar bone resorption score was 1.34 ± .019 at ages 21 to 30. At ages 61 to 70 the score had increased to an average of 2.30 ± .078. In view of the fact that the minimum possible score is zero and the maximum possible score is 3.00, it is evident that bone resorption around the teeth begins in early adult life and increases considerably with aging.

When the degree of resorption in patients of various disease groups was compared with that of the control group, it was found that endocrine diseases seem to have the greatest influence on alveolar bone resorption with statistically significant differences at all ages (Table 7).

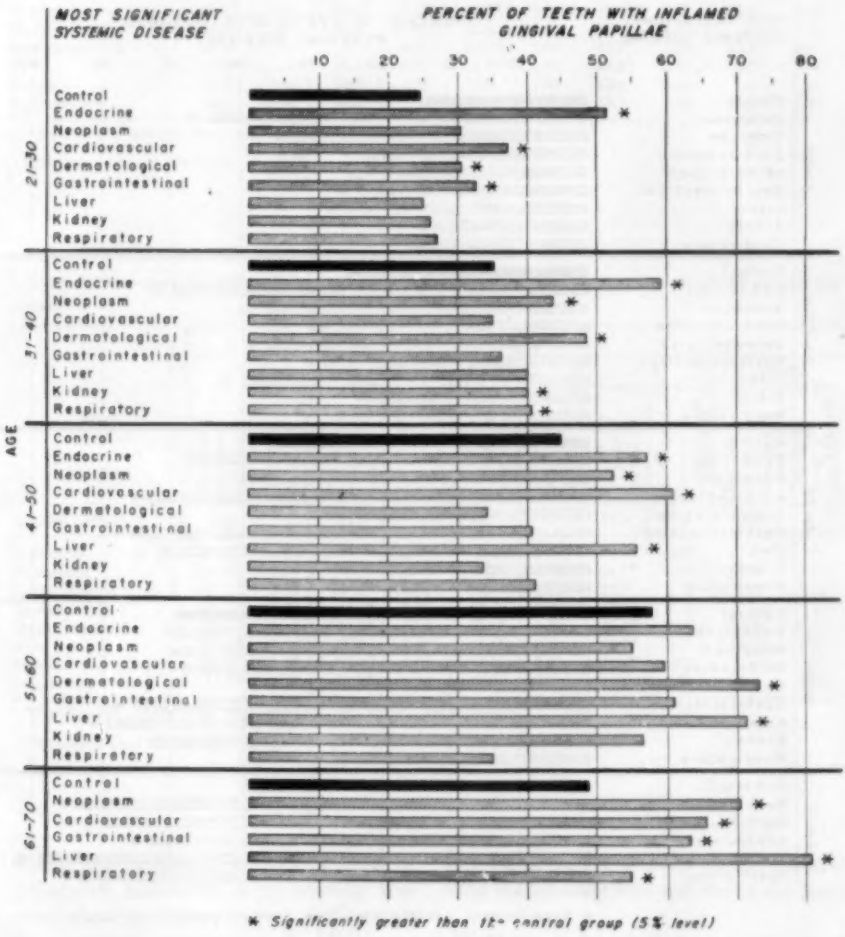

Fig. 5 • Number of gingival papillae inflamed per 100 teeth, by age and most significant systemic disease

Most of the patients in the endocrine group were diabetics, and a few had thyroid or pituitary dysfunctions.

For every age group a significantly greater degree of bone resorption had occurred in patients with malignant diseases than in patients of the control group. Patients with cardiovascular disease also had lost more alveolar bone in age groups 21-30 and 51-70 than had those of similar ages in the control group (Table 7).

DISCUSSION AND SUMMARY

Abnormal metabolic or biochemical processes deplete tissue resistance and produce periodontal lesions by different mecha-

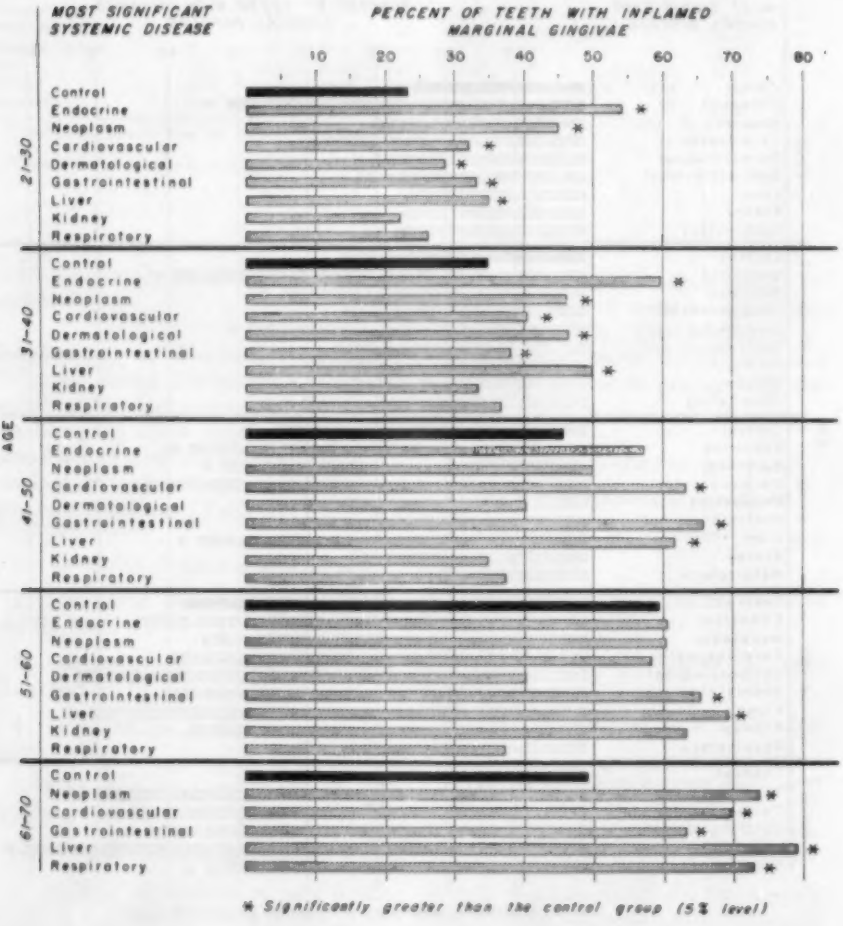

Fig. 6 • Number of marginal gingivae inflamed per 100 teeth, by age and most significant systemic disease

Table 5 • Percentage of teeth with marginal gingivae inflamed, by age of patient and most significant generalized disease

Most significant generalized disease	Age									
	21-30		31-40		41-50		51-60		61-70	
	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**
Control group	23.1		35.0		45.9		59.5		49.5	
Endocrine	54.1*	3.01	59.7*	2.52	57.9	6.37	60.7	4.27	—	—
Neoplastic	45.0*	3.00	46.2*	2.14	50.0	3.57	60.5	2.25	73.8*	3.37
Cardiovascular	32.1*	2.50	40.6*	2.11	63.2*	2.84	58.6	2.04	70.0*	3.24
Dermatological	28.8*	1.61	46.4*	1.97	40.4	3.47	40.4	4.92	—	—
Gastrointestinal	33.1*	1.26	38.1*	1.41	65.7*	2.85	65.7*	2.96	63.3*	5.61
Liver	35.0*	1.74	50.0*	4.08	61.9*	3.31	69.5*	3.53	79.3*	4.26
Kidney	22.1	1.60	33.9	1.92	35.0	2.96	63.6	3.67	—	—
Respiratory	26.2	2.56	36.8	2.35	37.0	5.20	37.5	5.34	73.0*	5.27

*Significantly greater than the control group of the same age.

**Standard error of difference $= \sqrt{\frac{pq}{n_1} + \frac{pq}{n_2}}$.

Table 6 • Percentage of teeth with recession of gingivae, by age of patient and most significant generalized disease

Most significant generalized disease	Age									
	21-30		31-40		41-50		51-60		61-70	
	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**	Per cent of teeth affected	Standard error of difference**
Control group	12.6		23.6		43.7		59.6		64.9	
Endocrine	41.4*	2.95	44.4*	2.56	71.0*	5.10	72.1*	3.97	—	—
Neoplastic	20.5*	2.44	45.8*	2.11	74.2*	3.19	64.3*	2.23	70.8	3.21
Cardiovascular	27.1*	2.36	39.4*	2.08	59.7*	2.88	58.9	2.10	78.8*	3.03
Dermatological	21.3*	1.44	34.6*	1.86	63.5*	3.41	79.0*	4.18	—	—
Gastrointestinal	23.8*	1.11	34.0*	1.35	72.8*	2.72	70.3*	2.90	63.3	2.94
Liver	22.5*	1.50	25.0	3.20	61.9*	3.31	75.9*	3.31	76.3*	4.33
Kidney	26.9*	1.68	31.7*	1.85	42.1	3.04	73.6*	3.92	—	—
Respiratory	16.9*	2.19	36.5*	2.24	57.0*	5.31	62.5	5.39	53.0	5.70

*Significantly greater than the control group of the same age.

**Standard error of difference $= \sqrt{\frac{pq}{n_1} + \frac{pq}{n_2}}$.

nisms. The prolonged periods of nitrogen imbalance associated with wasting diseases deplete tissue reserves and impair the antibody mechanism.[22] Malignant neoplasms tend to cause generalized wasting of tissues. Cardiovascular diseases alter the vascular bed and starve the local

22. Cannon, P. R., and others. The relationship of protein deficiency to surgical infection. Ann. Surg. 120:514 Oct. 1944.

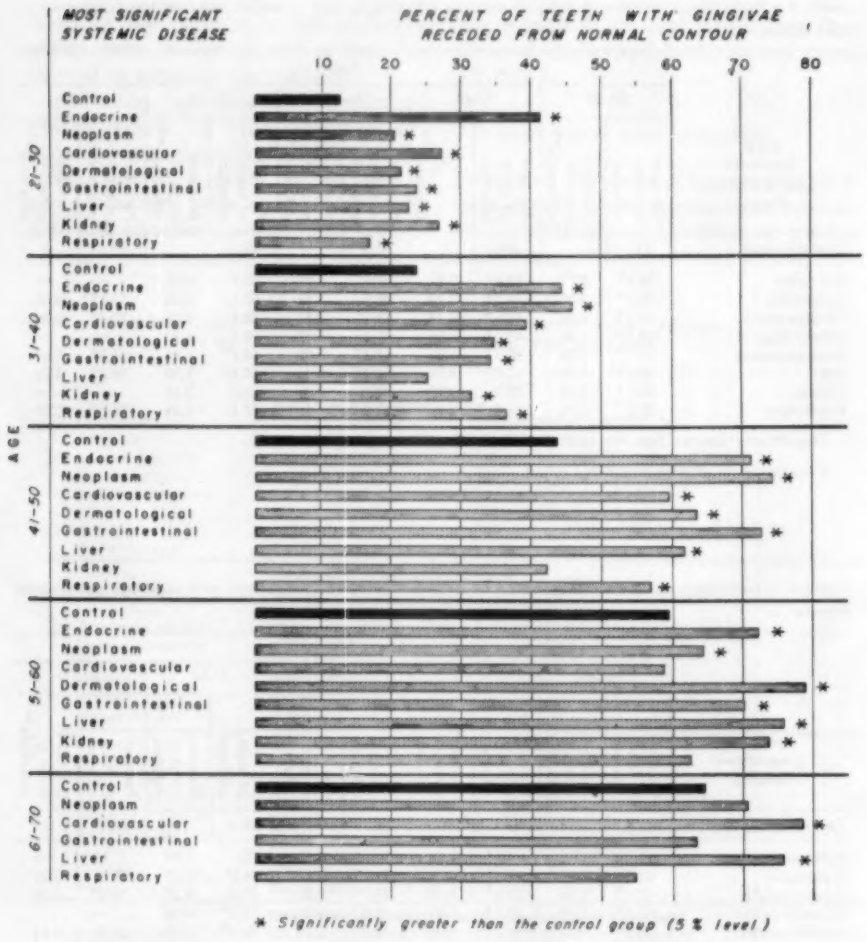

Fig. 7 • Number of gingivae receded from normal contour per 100 teeth, by age and most significant systemic disease

tissues through lessened blood supply,[23] while endocrine dysfunction and nutritional deficiency states alter metabolism and calcification.

Gingival tissues and periodontal bone are subject to continuously repeated local irritation and trauma. It seems probable that the superimposition of local trauma or dysfunction on depleted resistance of tissues will produce periodontal lesions more readily and that these lesions will respond to treatment more slowly.

23. Stehl, S. S., and Fox, L. M. Histologic changes of the oral mucosa associated with certain chronic diseases. Oral Surg., Oral Med. & Oral Path. 6:339 Feb. 1953.

Table 7 • Average degree of alveolar bone resorption for patients with specified diseases by age groups

Age group	Disease group											
	Control group		Endocrine			Neoplastic			Cardiovascular			
	Average alveolar bone loss score	Standard error	Average alveolar bone loss score	Standard error	Critical ratio*	Average alveolar bone loss score	Standard error	Critical ratio*	Average alveolar bone loss score	Standard error	Critical ratio*
21-30	1.34	.019	1.88	.168	3.03	1.66	.148	2.00	1.57	.113	2.02
31-40	1.56	.047	2.11	.152	3.43	1.99	.104	3.77	1.77	.112	1.88
41-50	1.90	.058	2.30	.200	1.92	2.41	.108	4.14	2.01	.045	1.51
51-60	2.29	.061	2.61	.132	2.21	2.48	.076	1.96	2.52	.062	2.65
61-70	2.30	.078	—	—	—	2.58	.100	2.21	2.61	.086	2.67

*Difference between mean and mean of control group / Standard error of the difference

In this study of 1,299 white male hospitalized veterans classified according to the most significant systemic disease, it was found that:

1. The average number of teeth decreases with aging at about the same rate regardless of generalized disease.

2. Inflammation of the gingival papillae and inflammation of the marginal gingivae are closely associated. Gingival inflammation, gingival recession and the resorption of alveolar bone are associated but do not occur with sufficient constancy to warrant the prediction of one symptom from the other.

3. Inflammatory and degenerative gingival symptoms increase with aging but are significantly more widespread in persons with generalized debilitating diseases. Alveolar bone resorption also increases with aging and tends to be more severe in patients who are suffering from endocrine dysfunctions, malignant neoplasms and from cardiovascular diseases.

4. The observations of this study support the hypothesis that generalized diseases tend to influence the initiation and increase the severity of periodontal disease.

Future Coin • The coinage of the future will not alone be gold as in the past, but will grow into brains, equipment and material with controlled energy, and only on this basis can we make the necessary readjustment of all values. *C. H. Mayo, "Tomorrow's Education Seen by Dr. Mayo," Northwestern University Alumni News 10:17, July, 1931.*

Salivary contribution to enamel maturation and caries resistance

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The teeth of laboratory animals have been shown to deteriorate rapidly after the surgical removal of the major salivary glands.[1-4] In order to explain fully this observation, it is necessary to seek more exact experimental information regarding the physiologic interrelationships between the saliva, the enamel, the dentin and the internal blood supply of the teeth. As an indirect approach to this problem, two experiments have been conducted to determine whether the normal exposure of the molar teeth of rats to saliva for various periods of time after eruption into the oral cavity would materially affect the subsequent caries resistance of the teeth.

EXPERIMENT

In the first experiment, 72 rats of the Sprague-Dawley strain were weaned at 21 days of age and divided into six groups which were similar with respect to sex and littermate distribution. All six groups were maintained for 40 days on purified carbohydrate-free ration (no. 170) which, in prolonged studies in the laboratory of the Harvard University, School of Dental Medicine, has been shown to prevent the initiation of carious lesions, even after desalivation.[5] The 12 rats in Group 1 were surgically desalivated on the twenty-first day of age, that is, the day of weaning. Ten, 20, 30, and 40 days after weaning, respectively, the rats in Groups 2, 3, 4 and 5 were desalivated. In each case, the parotid, the submaxillary, the major sublingual and the extraorbital lacrimal glands were removed bilaterally in one stage under ether anesthesia. The 12 rats in Group 6 were maintained as controls. On the sixty-first day of age, the fortieth experimental day, two rats from each group were sacrificed for studies of the teeth; the remaining animals in each

This investigation was supported in part by a research contract with the Dental Research Branch of the Medical Research and Development Board of the United States Army and in part by the Eugene Higgins Trust.

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†Assistant professor of dental medicine, Harvard School of Dental Medicine.

‡Professor of oral pathology and associate dean, Harvard School of Dental Medicine.

1. Cheyne, V. D. A description of the salivary glands of the rat and a procedure for their extirpation. J. D. Res. 18:457 Oct. 1939.

2. Weisberger, D.; Nelson, C. T., and Boyle, P. E. The development of caries in the teeth of albino rats following extirpation of the salivary glands. Am. J. Orthodont. & Oral Surg. 26:88 Jan. 1940.

3. Shaw, J. H., and Weisberger, D. Carious lesions in the cotton rat. II. The effect of removal of the principal salivary glands. Proc. Soc. Exp. Biol. & Med. 70:103 Jan. 1949.

4. Klapper, C. E. Influence of salivary gland extirpation on development of dental caries in the Syrian hamster. (Abst.) J. D. Res. 30:486 Aug. 1951.

5. Shaw, J. H. Effect of carbohydrate-free and carbohydrate-low diets on the incidence of dental caries in white rats. J. Nutrition (submitted for publication).

group were transferred from the noncaries producing ration (no. 170) to a highly cariogenic diet (no. 100).[6] In other words, the exposure of the teeth (in all six groups) to the cariogenic ration was begun simultaneously on the sixty-first day of age. After 114 days on the caries-producing dietary regimen, all rats were sacrificed, their heads fixed in 10 per cent neutral Formalin, and the dental caries incidence determined by previously established criteria.[7]

The second experiment, involving a total of 90 rats, was divided into two parts: Part A was a repetition of the first experiment; Part B differed from the first experiment in only one respect; namely, that the groups of rats were transferred to the cariogenic diet at the time of weaning, that is, prior to rather than after the completion of all desalivations.

RESULTS

In the first experiment, the two rats which were sacrificed in each group at 61 days of age after 40 days on the noncariogenic diet no. 170 were completely free of any carious lesions. This observation, coupled with previous studies of the caries-preventive ability of this diet, was taken as an absolute indication that the remaining 10 rats in each of the 6 groups were caries free at the time the cariogenic diet no. 100 was begun. The results obtained from the remaining rats at the end of the one hundred and fourteenth day on the caries-producing ration are shown in the table. None of the rats in the control group developed any carious lesions during this period. In the five experimental groups, however, the combination of a caries-producing ration and desalivation resulted in an appreciable development of carious lesions. It is noteworthy, how-

6. Shaw, J. H. Carious lesions in cotton rat molars. I. The role of mechanical factors studied by the extraction of antagonistic molars. J. D. Res. 26:47 Feb. 1947.

7. Shaw, J. H., and others. Dental caries in cotton rat; production and description of carious lesions. J. D. Res. 23:417 Dec. 1944.

Table • Effect of desalivation at different ages on the caries incidence of rats maintained on a caries-producing diet for the same length of time[1]

Group	No. of rats	Desal. age	No. of carious molars		No. of carious lesions		Extent of carious lesions	
			Avg.	SEM[2]	Avg.	SEM[2]	Avg.	SEM[2]
1	10	21	10.6	0.8	22.3	2.2	93.7	11.5
2	10	31	8.4	1.3	14.8	2.9	58.1	13.6
3	10	41	8.5	0.9	14.0	2.0	53.3	8.5
4	10	51	7.4	1.3	11.1	2.2	41.9	10.1
5	10	61	6.0	0.9	8.4	1.6	28.2	6.4
Control	10	—	0	0	0	0	0	0
Critical ratio[3]								
Comparing groups								
1 vs. 2			1.5		2.0		1.9	
1 vs. 3			1.8		2.8		2.8	
1 vs. 4			2.1		3.5		3.4	
1 vs. 5			3.3		5.3		4.9	
1 vs. control			13.3		9.8		8.0	

1. All rats maintained on noncaries-producing carbohydrate-free diet from 21st to 61st days of age and then transferred simultaneously to a caries-producing diet for 114 days.
2. SEM—Standard error of mean.
3. CR—Critical ratio. The critical ratio is the ratio of the difference between two means to the standard error of the difference between the means. Wherever the critical ratio is less than 2.0, the difference between the means is considered to be statistically insignificant; when from 2.0 to 2.9, moderately significant; when 3.0 or higher, highly significant.

ever, that none of the three criteria for evaluation of the dental caries—the average number of carious molars, the average number of carious lesions and the average extent of carious lesions—were similar for the five groups despite the fact that the rats in all groups were maintained on the caries-producing regimen for identical periods of time. From the data, it is evident that there was a progressively greater decrease in the average number of carious molars, the average number of carious lesions and the average extent of carious lesions as the age at which desalivation was performed was increased.

In the case of the average number of carious molars, the differences were not highly significant statistically except for the comparison between the rats desalivated at 21 and 61 days of age. For the average number of carious lesions and the average extent of carious lesions, however, the differences between the groups desalivated on the twenty-first and sixty-first and on the twenty-first and fifty-first days of age were highly significant statistically. In addition, the differences between the groups desalivated on the twenty-first and forty-first days of age were statistically significant at the 5 per cent level.

The results from the first half of the second experiment also followed the trend toward a reduction of the dental caries incidence in animals which were desalivated at the later age. This confirmed the observation made in the first experiment. The critical ratios of the differences between the group desalivated at weaning and the control group were 10.6 for the average number of carious molars, 8.6 for the average number of carious lesions and 6.2 for the average extent of carious lesions. These critical ratios are of the same order as those in the first experiment, and the intermediary groups also showed the same general trend.

The data obtained in the second half of the second experiment can be summarized by the statement that despite the fact that the rats in all groups were maintained on the caries-producing ration for the same period of time, the rats which were desalivated earliest, and thus automatically without salivary glands the longest, had the highest incidence of tooth decay. The critical ratios of the difference between the rats in the group desalivated at weaning and the control group were 6.6, 10.7 and 5.8 for carious molars, carious lesions and extent of carious lesions, respectively.

DISCUSSION

The afore-mentioned experimental results suggest that the exposure to a normal salivary environment during the period of tooth eruption has a definite influence on the future caries susceptibility of young erupting teeth. There is no clear-cut explanation for this. No conspicuous alterations have been observed or reported in the appearance of the enamel of erupting or functioning teeth on inspection by the naked eye or ordinary roentgenographic examination.

Other methods have provided a few suggestive clues as to what may represent important maturation phenomena within the dental hard tissues during and after eruption into the oral cavity.

Histological studies on enamel development usually have made a major distinction between the young matrix stage, in which the enamel remains relatively intact after demineralization, and the mature stage, in which the enamel has been characterized as acid-soluble because it usually disappears completely during demineralization.[8] More recent work has shown that even the fully mature enamel retains an organic framework, the successful recovery of which requires various careful methods of demineralization. This organic framework could not be fully

8. Diamond, N., and Weinmann, J. P. The enamel of human teeth. New York, Columbia University Press, 1940.

viewed under the ordinary optical microscope.

More recently electron microscopy, on the other hand, has revealed that, in addition to the prism sheaths, there are submicroscopic fibrillar organic networks which permeate the substance both within and between the enamel prisms.[9] Furthermore, progressive submicroscopic changes have been observed in the organic matrix of developing enamel from a homogeneous to a fibrillar matrix between immature and fully developed, calcified enamel.[10]

Histochemical reactions have suggested that there exists a difference in the staining properties of young maturing teeth and teeth which have completed their calcification. The ability to take up stain may be greatly diminished or even completely absent.[11]

Radioisotope studies in rhesus monkeys have revealed a considerably higher P^{32} activity in the enamel of the erupting teeth than in the erupted ones.[12] The ratio of radioactivity between whole enamel and dentin of fully erupted teeth was 1 to 8 as compared to approximately 14 to 17 for immature teeth. Moreover, the tracer studies have suggested that saliva contributes significantly to the ion exchange and to the permeability of the enamel.

Thus histologic, electromicroscopic, histochemical and radioactive tracer studies tend to suggest that there is some as yet incompletely understood difference beween immature young enamel and fully mature enamel, possibly involving the size of the crystals and their bond to the organic matter.

Differences of this or similar nature may offer an explanation for the fact that those teeth which were exposed to the salivary influence during the period of eruption and maturation exhibited a higher degree of caries resistance than did the teeth of animals desalivated at the beginning of the experiment. This concept of a salivary contribution to enamel maturation and subsequent caries resistance merits further exploration.

CONCLUSION

The results of this investigation suggest that abnormal salivary environment during the period of tooth eruption may have a significant bearing on the maturation of the enamel as manifested by the subsequent resistance to dental caries.

9. Scott, D. B., and others. Electron microscopy of mature human enamel. J. D. Res. 31:74 Feb. 1952.

10. Sognnaes, R. F., and others. Electron microscopy of the enamel of teeth in various stages of development. J. D. Res. 31:85 Feb. 1952.

11. Wislocki, G. G., and Sognnaes, R. F. Histochemical reactions of normal teeth. Am. J. Anat. 87:239 Sept. 1950.

12. Sognnaes, R. F., and Shaw, J. H. Salivary and pulpal contributions to the radiophosphorus uptake in enamel and dentin. J.A.D.A. 44:489 May 1952.

The Benefits of Words • Words, like deeds, may be constructive or destructive, elements of strength or expressions of decay. Those who learn to speak with charm, precision, vigor, and good diction, soon experience the benefits of well-used words. *William G. Niederland, Man-Made Plague: A Primer on Neurosis.*

Preanesthetic management of the dental patient

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George Bernard Shaw's statement that anesthesia spares us nothing but the knife,[1] while not as true today as when it was written in 1906, nevertheless, still has an element of truth in it. Since the ideal preanesthetic sedative is yet to be discovered, it is necessary to make the best use of what is available. In the past 20 years much has been learned about the psychodynamics of anxiety and apprehension and their treatment with psychotherapy. The interest of the dental profession is evidenced by the creation during the past decade of numerous academies, institutes and societies devoted to "dental psychosomatics"[2] and "hypnodontia."

As is customary whenever a sudden interest in a particular scientific subject is manifested, many untried theories are proposed, and there is a great deal of misinformation and wishful thinking. The dental literature has been filled with enthusiastic reports and, almost in equal volume, criticisms of sedation. Fewer practitioners are trained in this difficult psychiatric field than would appear from the number of authors who have ventured into the vast field of theory and therapy of anxiety and apprehension.[3] It is not at all surprising therefore that the psychosomatic approach to this subject has met with considerable resistance from many members in the profession who base their judgments on more solid ground than much of the current theorizing.

The terms "tender-minded" and "tough-minded," originally proposed by the psychologist William James, may be applied to scientists. The "tender-minded" scientist in interpreting facts might base his judgment roughly 60 per cent on reason and 40 per cent on such commendable but emotion-fraught attributes as faith, hope and charity. In contrast, the "tough-minded" scientist might make use of as much as 80 or 90 per cent of the "rationalization potential."[4]

In the matter of "dental psychosomatics" and "hypnodontia," it would appear that the "tender-minded scientists" are in the ascendancy, in view of the preponderance of hopeful predictions in regard to simple and easy methods for allaying anxiety and apprehension as well as for elevating the threshold of pain. The

Presented before the American Society for the Advancement of General Anesthesia in Dentistry, New York, October 26, 1953.

1. Shaw, G. B. Doctors' dilemma: with preface on doctors. New York, Brentano's, 1913.

2. Ryan, E. J. Psychobiologic foundations in dentistry. Springfield, Ill., Charles C Thomas, 1946.

3. Noakes, P. Report of case of root resection performed under hypnosis. Oral Surg., Oral Med. & Oral Path. 4:1158 Sept. 1951.

4. Hansteen, H. B. Tender-minded scientists. Am. Scientist 36:426, 1948.

truth of the matter is that true anxiety, apprehension and fear are not at all easily controlled.

If the measures taken to reduce these symptoms are to be effective, they must be adequate. The more severe the symptoms, the more drastic the treatment, and the more drastic the treatment, the more will be the noxious side effects. The result of treatment in extreme cases often is merely the replacement of one set of symptoms with another set.

Any situation in which anxiety and apprehension of the patient are important factors requires an analysis from both the chemotherapeutic and the psychotherapeutic viewpoints. An understanding of the psychodynamics of anxiety, apprehension and fear in general and especially of dental patients requires a knowledge of unconscious mechanisms. The practitioner must know the significance of symptoms and their effectiveness as protective mechanisms in keeping the personality intact. He must understand the manner in which emotional changes are mediated through the central nervous system, affecting the endocrine system and altering metabolism, and the many ways in which every system and organ of the body is affected by changes in emotional tension.

REVIEW OF LITERATURE ON ANXIETY AND APPREHENSION

Opinions on the treatment of ambulatory dental patients range from the viewpoint that premedication is essential in all cases regardless of the type of anesthesia to be used to the viewpoint that premedication is rarely necessary and should be reserved for exceptional cases only. An overwhelming majority of writers on this subject state that premedication is desirable; however, a statement cannot be considered a fact just because a majority of individuals believe it to be true. It is of interest to analyze the difference of opinion and the reasons for it.

Gwathmey,[5] a pioneer in anesthesiology, was a strong advocate of preliminary medication, but some of his pupils did not agree with him. Guedel[6] stresses the need to decrease the metabolic rate before using nitrous oxide. He points out that with the exception of atropine all drugs used in preanesthetic preparation are directed toward the reduction of metabolism and that atropine, a potent metabolic stimulant in itself, is beneficial only in drying mucous secretion and in lessening reflex response to cardiac vagus activity. He reports further that the most frequent anesthetic accident which the beginner encounters is an acapnial apnea in children. This, in his opinion, is due most commonly to inadequate preanesthetic sedative medication; the metabolism of older people is usually lower, and consequently, premedication requirements are less than for younger patients.

In the opinion of Clement,[7] "It is futile to attempt the use of nitrous oxide-oxygen routinely for major surgery without particular care being given to the premedication of the patient." Preliminary medication, he maintains, is indicated in all cases of inhalation anesthesia and in the majority of cases where a local agent is used; he asserts also that preoperative and postoperative medication should be used routinely, without exception, in all major operations and also in many minor ones, regardless of the type of anesthesia employed. Clement is inclined to the view that reduction of metabolism is a function, if not the function, of anesthetics,[8] that therefore the action of the anesthetic is anticipated or enhanced by the administration of suit-

5. Gwathmey, J. T. Anesthesia, ed. 2. New York, Macmillan Co., 1925, p. 369.

6. Guedel, A. E. Inhalation anesthesia. New York, Macmillan Co., 1945, p. 67, 94.

7. Clement, F. W. Nitrous oxide-oxygen anesthesia, ed. 3. Philadelphia, Lea & Febiger, 1951, p. 64, 65.

8. Whitehorn, J. C.; Lundholm, H., and Gardiner, G. E. Metabolic rates in emotional mood induced by suggestion in hypnosis. Am. J. Psychiat. 9:661 Jan. 1930.

able sedative or narcotic agents before operation. Such, in his opinion, is the purpose of premedication.

He is well aware that the psychological attitude of the patient is always a matter of importance to the experienced surgeon. Some surgeons will refrain from operating—except in emergencies—when the patient is unusually apprehensive or fearful of the ordeal ahead. Such patients are recognized as poor subjects for either anesthesia or surgery, since they are more likely to die under anesthesia or it is more probable that shock will develop.

Clermont,[9] an able anesthesiologist, contends that "The psychosomatic approach is of primary importance for the conduct of surgical anesthesia." He advises that the patient should be reassured beforehand by the dental surgeon and again by the anesthesiologist. In addition to this preanesthetic psychological preparation of the patient, he gives the average adult 100 mg. dimenhydrinate (Dramamine) an hour prior to the anesthesia and only half the dose to children from 5 to 12 years of age. It is his belief that this preanesthetic treatment induces a sense of well-being in the patient, checks bronchial secretions and avoids postoperative vomiting even if the oral surgery lasts for more than an hour.

Adriani[10] recommends the use of preanesthetic sedation to relieve apprehension, to decrease somewhat the length of the second stage of inhalation anesthesia, to reduce metabolism and to decrease reflex irritability. He names as the common errors in premedication: too early administration, insufficient premedication and overmedication. If premedication is omitted, however, he warns, the induction period may be prolonged and complicated with overexcitement, a copious flow of mucus, a laryngeal spasm and poor relaxation.

Cullen[11] is even more emphatic in stating the need for adequate preliminary medication. He decries the routine use of combinations and dosages, however, and favors selection of drugs on the basis of the patient's physical state and the anesthetic agent and technic to be used. He points out that apprehension, fear, undesirable psychosomatic responses and unpleasant memories can be minimized or eliminated entirely by the judicious use of premedication, without coincidental undesirable depression of circulation and respiration or of basic compensatory and protective mechanisms.

Eskin[12] found that mephenesin (Tolserol) administered 25 to 45 minutes before anesthesia produced adequate relaxation in 49 out of 57 patients showing either moderate or great apprehension. In his opinion, mephenesin shows definite promise as a preoperative sedative. More work is being done with this drug, but since "moderate or great apprehension" is difficult to measure accurately as is also the relaxation resulting from the use of the drug, it will be some time before conclusive and acceptable results are formulated.[13] Matthews[14] states that "lack of premedication is one of the chief reasons for anesthetic difficulties in children." In his experience elixir of pentobarbital given half an hour before an operation is highly beneficial.

In their textbook on general anesthesia, MacIntosh and Pratt[15] discuss in considerable detail preliminary medication, the psychological aspects of the preanesthetic state and the psychological methods of counteracting them. They advise

9. Clermont, M. How to stay out of trouble in dental anesthesia. Paper delivered before International Anesthesia Research Society, Montreal, Oct. 29, 1953.

10. Adriani, J. Techniques and procedures of anesthesia. Springfield, Ill., Charles C Thomas, 1947, p. 12-13.

11. Cullen, S. C. Anesthesia in general practice, ed. 2. Chicago, Year Book Publishers, 1948, p. 15-18.

12. Eskin, L. C. Tolserol for sedation prior to oral surgery. Oral Surg., Oral Med. & Oral Path. 4:1246 Oct. 1951.

13. Squibb, E. R. & Sons. Toserol; annotated bibliography, 1952.

14. Matthews, G. W. Preoperative and postoperative sedation for children. J. Oral Surg. 10:151 April 1952.

15. MacIntosh, R. R., and Pratt, F. B. B. Essentials of general anesthesia, ed. 4. Springfield, Ill., Charles C Thomas, 1948, p. 107-117.

the student who desires to master the technic of anesthesia not to overlook the important part played by premedication in achieving good results. They explain that a patient exposed to pain is more restless when he is under the influence of a cortical depressant drug such as a barbiturate than when he is conscious, probably because of loss in control of the higher centers which enhance the responses to pain and other stimuli.

Ideally, preparation for a dental extraction, in their opinion, should begin with the administration of a sedative the night before the operation in order to prevent the irritability which follows loss of sleep. They believe that it is neither necessary nor desirable to make the patient drowsy but that the dose of the premedicant drug should be sufficient to obviate anxiety at the thought of the anesthetic. It might be pointed out that this suggestion is hardly feasible, since a moderate degree of drowsiness is necessary to obviate anxiety produced specifically by the thought of anesthesia or an operation.

These authors note that for anesthesia with nitrous oxide and perhaps with trichloroethylene, premedication is not only a comfort to the patient but of considerable practical assistance to the anesthetist. In fact, it may make the difference between a turbulent and a peaceful anesthesia. They point out an important fact, often forgotten, that in the alcoholic patient alcohol itself is an excellent premedicant.

Evans in his book on anesthesia[16] declares that there is no doubt that many difficulties during the induction of anesthesia are due to overpremedication, especially with the use of scopolamine. Kaye, Orton and Benton[17] find that it is difficult to prescribe a sedative for the ambulatory patient, since mental and physical relaxation is necessary for its proper action.

Slavin,[18] working in the oral surgery clinic of the Columbia University School of Dental and Oral Surgery, tried out the effects of meperidine (Demerol) premedication in the ambulatory patient. Fifty patients were given meperidine, 50-75 mg. for children under 16 and 100 mg. orally in one dose for adults. He found that it produced little analgesic effect in controlling pain from the needle prick and that sedative action was slight. It was his conclusion that the side reactions produced in the ambulatory patient from the use of meperidine were objectionable.

The clinical impression that morphine, meperidine, Pantopon and other opiates when used as premedicants have unpleasant side effects is borne out by the work of Paulson,[19] of the Mayo Clinic, who observed that in a thiopental (Pentothal) sodium, nitrous oxide, oxygen, and ether anesthesia, the incidence of nausea and vomiting is probably increased by the use of morphine as a premedicating agent. Paulson's studies of respiratory minute volume revealed a greater mean minute volume while the patient was under anesthesia with thiopental sodium and ether than before anesthesia when the patient was conscious and had not received any medication. The ⅙ grain of morphine was given intravenously together with 1/150 grain of atropine sulfate just prior to anesthesia.

The writers who maintain that preliminary medication for the relief of anxiety and apprehension in the ambulatory dental patient is only rarely necessary and should be reserved for the exceptional cases are greatly in the minority; nevertheless, they are men of such high professional caliber that it is worth while to analyze their views.

16. Evans, F. T., editor. Modern practice in anaesthesia. New York, Harper & Brothers, 1949, p. 158-162.

17. Kaye, G.; Orton, R. H., and Benton, D. G. Anaesthetic methods. Melbourne, Australia, W. Ramsay Pty., 1946, p. 134.

18. Slavin, M. I. Demerol premedication in the ambulatory patient. Oral Surg., Oral Med. & Oral Path. 3:1159 Sept. 1950.

19. Paulson, J. A. Thiopental sodium and ether anesthesia. J.A.M.A. 150:983 Nov. 8, 1952.

Feldman[20, 21] states that he has discontinued the administration of hypnotic drugs prior to anesthetic induction because these drugs do not quiet the troublesome patient. In his opinion the slight stupefaction produced by the hypnotic drug administered 20 minutes to half an hour before surgery has no salutary effect. It has been his experience that the instances of demonstrable excitement during induction are few enough to warrant the elimination of premedication, that indeed the overwhelming majority of patients show no physical variation in attitude or response from the moment the inhalator is applied to the face to the moment of recovery of consciousness.

He gives the following reasons for not using any premedication for the majority of patients:

1. The resistance of the patient who has received premedication increases as the anesthesia deepens.

2. It is not necessary to administer premedication to all patients merely because of difficulties with a few patients.

3. A patient should leave the office in as clear a mental state as he has arrived. Stupefaction is of no advantage in the office.

4. Premedication with drugs potent enough to depress the center of respiration and the blood pressure to dangerous levels is questionable practice.

Whether local or general anesthesia is the vehicle of choice for the operator, maintains Feldman, the personality of the doctor and the confidence he is able to impart to his patient are significant.

Courville,[22] who deplores the unnecessary use of preliminary medication, has observed from the cases that have come to his attention that the greater the number of drugs thus used, the greater is the likelihood for the development of anoxemia, perhaps for the reason that drugs act on the center in various ways and in various proportions. He adds that in individuals whose centers are unduly sensitive to such drugs, respiratory and even cardiac activity may suddenly cease as a result of the depression of anoxemia incident to nitrous oxide.

The authoritative report of 11 years of observation by the Anesthesia Study Commission[23] shows that out of a total of 306 deaths from anesthesia, there were 58 instances where preoperative medication was adjudged either inadequate or excessive and contributed to the deaths.

Bergner and his associates[24] do not use premedication routinely in the oral surgery section of the University of Louisville School of Dentistry, since, in their opinion, the ambulatory patient should not be subjected to the hazards of belladonna, barbiturate or opiate drugs. Children are given a barbiturate one hour before anesthesia. When necessary, adults, if accompanied by a responsible person, may be given a barbiturate three quarters of an hour prior to an operation. At times they have been given meperidine or a barbiturate intravenously five minutes before an operation, but apparently this premedication is not routine for adults.

Pickrell and his associates at Duke University[25] consider premedication unnecessary when trichloroethylene is used and have observed that the patient can walk out of the office in 20 minutes after an operation. Stephen, Nowill and Martin[26] comment that of the several factors which may produce hypotension the ef-

20. Feldman, M. H. Emotional factors involved in inhalation anesthesia. D. Digest 56:223 May 1950.

21. Feldman, M. H. Exodontia, ed. 4. Philadelphia, Lea & Febiger, 1951, p. 16-20.

22. Courville, C. B. Untoward effects of nitrous oxide anesthesia. Mountain View, Calif., Pacific Press Publishing Association, 1939, p. 116.

23. Ruth, H. S.; Haugen, F. P., and Grove, D. D. Anesthesia study commission. Findings of eleven years' activity. J.A.M.A. 135:881 Dec. 6, 1947.

24. Bergner, R. P., and Herd, R. M. General anesthesia for dental surgery. J. Kentucky D. A. 4:3 Oct. 1952.

25. Pickrell, K. L., and others. Self-induced "Trilene" analgesia in plastic surgery, with special reference to the burned patient. Plast. & Reconstruct. Surg. 9:345 April 1952.

26. Stephen, C. R.; Nowill, W. K., and Martin, R. Diagnosis and treatment of hypotension during anesthesia. Anesthesiology 14:180 March 1953.

fect of premedicant drugs sometimes is overlooked. They state that a moderate decrease in arterial tension is to be anticipated from the quieting physical and psychological effect of the sedation; but in some patients, particularly those with hypertension, the decrease may be extreme. A modified form of this reaction, they declare, probably occurs often and may be masked by the induction of general anesthesia and attributed to other factors.

Whether by design or accident, the subcommittee on anesthesia of the National Research Council in its monograph on the fundamentals of anesthesia,[27] places itself in a neutral position on the question of premedication. Although it discusses thoroughly the pharmacology and toxicology of the premedicant drugs, it leaves out the question of premedication as such.

The committee, under the heading of complications in anesthesia, however, states that the major effort of the anesthetist is directed to the prevention, amelioration and treatment of the complications accompanying and following the administration of anesthetic and depressant drugs. For nervousness and apprehension, the committee suggests a proper psychological approach and adequate preliminary sedation, though, it adds, only training and long experience will prepare the anesthetist to meet each complication promptly and wisely. The Committee stresses the fact that complete individualization of drug and dosage is the only safe procedure.

IMPRESSIONS FROM THE LITERATURE

From a review of both sides of the question, it appears that the differences existing between the two schools of thought —to administer premedication or not to administer premedication—are more apparent than real. Those who choose not to administer premedication routinely are perhaps more confident of their ability to handle the ambulatory patient than some of those who rely on chemotherapy alone. They feel certain that they can detect quickly the unusual patient who needs premedication.

One must take into consideration that the opinions of various authors are based on cross sections of different patients. The clinic patient, the so-called white-collar worker, the manual worker, the society woman, the high-pressured executive, the teacher—each may react to stress and strain somewhat differently, depending on his training, culture, and the esteem or nonesteem in which he views the therapist.

In any event, both schools agree on two points: (1) Premedication should be administered to the unusual patient. (2) A patient who has received premedication should be escorted home by a responsible person. Both schools agree also that all patients need reassurance and personal attention during periods of apprehension and anxiety, even if some patients tend to hide their need because of their training, upbringing or social fears.

Obviously practitioners who are more proficient in psychotherapy—whether their skill was acquired naturally or through formal training—tend to use premedication less than others. If the dentist's chief interest is in the manipulative aspects of oral surgery, he is less apt to consider the patient as a whole—though it would be hard to find one who would admit it. Both groups agree that if premedication is employed, care must be taken to use as few drugs as possible, to know their action well, to individualize the dosage and to time its administration so that the patient benefits most from the smallest effective dose of the medicant. It is universally agreed that the greater the experience and ability of the anes-

27. National Research Council, Subcommittee on Anesthesia. Fundamentals of anesthesia. Chicago, American Medical Association, 1942, p. 142-143.

thetist, the less is the need for premedication.

THE MECHANISM OF ANXIETY AND APPREHENSION

If it is true that the technic of anesthesia cannot be learned from books alone, that for the most part instruction must be practical and can be taught only in the operating room, then it is truer still that the psychological aspects of the management of dental patients who receive premedication cannot be learned from textbooks alone. The subtleties involved in handling these patients successfully must be observed to make the theory practicable. A brief sketch of the psychodynamics of anxiety and apprehension will indicate the problems involved in an adequate evaluation of premedication.

Anxiety may be described as a feeling of diffuse, unformulated uneasiness and intense apprehension, which is usually reflected psychosomatically in a characteristic combination of visceromotor disturbances and skeletal tensions. Physical evidence consists of palpitation, disturbed respiration with hyperventilation, pressure sensations in the chest or throat, flushing, sweating and tremulous weakness. The language patients use to describe such symptoms varies, but the symptoms are alleviated when the stresses are relieved.[28]

It is not too difficult to ascertain that these stresses are made worse and the patient's anxiety reaches its peak when the patient's attempt to repress or handle this anxiety is interfered with by the induction of anesthesia which removes his defenses. A simple example of one type of defense against anxiety is the tendency to keep touching an aching tooth in order to re-elicit the pain and thus to reassert mastery over it. Once such retestings begin to evoke unbearable pain, the anxiety is repressed, and the explorations stop.

The severity of the perception of pain is highly contingent on expectancy and can be readily influenced by induced changes in attitude.[29] Every psychic and somatic manifestation of anxiety makes the induction and maintenance of anesthesia more difficult and at times more dangerous. The need to understand and treat anxiety in this situation is self-evident.

Anxiety covers a wide range of mental states, from mild uneasiness and worry to paralyzing panic. There is another type of anxiety which is very important from the practical point of view, namely, anxiety that is not experienced as such but is held in check by severe countermeasures. In patients with such anxiety, the somatic changes are much more severe, producing a decided increase in metabolism. For this situation, average doses of premedicants and average amounts of the anesthetic agent are totally inadequate. Insufficient attention has been paid to such factors in the evaluation of premedication drugs.

In the study of premedication it is not enough to name the drug and to state the number and percentage of patients helped or not helped. Some sort of classification of patients as to personality make-up must be made if the study is to have significance for research in chemotherapy and psychotherapy. It is important to know, for instance, that patients with anxiety have a low threshold for sensation of pain and that they respond with withdrawal and with signs of motor disturbance to lower intensities of stimulation than do normal subjects.[30] Results from experiments in which premedicants and anesthetics were tried out on students do not have the same value as

28. Masserman, J. H. Principles of dynamic psychiatry. Philadelphia, W. B. Saunders Co., 1946, p. 30.

29. Wolff, H. G., and Goodell, Helen. Relation of attitude and suggestion to perception of reaction to pain. In Pain, Association for Research in Nervous and Mental Disease. Baltimore, Williams & Wilkins, 1943.

30. Malmo, R. B., and Shagass, C. Physiologic studies of reaction to stress in anxiety and early schizophrenia. Psychosom. Med. 11:9 Jan.-Feb. 1949.

results from experiments on patients facing the anxiety of an operation and its results.

Fear produces a profound temporary change in the organism; if fear is intense enough, it may even destroy the organism. Expressions such as "frightened to death" are not simply figures of speech. Fear is not a spiritual experience, but a total biological response. With a repetition of fear responses, a conditioning takes place. This conditioning integrates the fear response into the whole mental and physical structure of the individual.[31]

A patient's fear may be so great that he may refuse to have either the anesthetic or the operation or both. If he allows himself to go through these experiences, however, the fear begins to operate as an anticipatory mechanism. Anticipatory fear and anxiety are very similar or probably even identical in some instances. Actually, the basis of most anxiety is anticipation of danger and the anticipatory alerting of the organism before the danger occurs.

Since the time of Freud, it has been customary to differentiate between fear and anxiety, fear being the reaction to a known danger and anxiety the reaction to an unknown danger. Furthermore, the source of fear is perceived as conscious, that of anxiety as unconscious. As yet it is not understood why in some anxiety reactions the anxiety is rapidly drained away by analysis of its nature and source, whereas in others no change occurs even after prolonged and intensive attempts.[31] In the latter case it is obvious that chemical means must be used to reduce the state of anxiety.

A further analysis may be of interest. Rosen[32] states that the fear of death evoked by the idea of a general anesthetic is the resurrection of an almost universal childhood anxiety which does not differentiate between death and the separation from, or the abandonment by, parental figures. Where such fears are outstanding, they should be taken seriously. When they are accompanied by evidence of panic, they should be an important indication for the use of a local anesthetic if it is surgically possible. The preservation of consciousness in such individuals by this means allows for continuous contact with the operator and thus reduces the element of fear that arises from separation anxiety.

Deutsch[33] suggests that female patients are more likely to demonstrate anxiety about separation than are males, who are more likely to resist the loss of control. She draws attention to the paradoxical situation in which the greater the real danger of an operation, the smaller the conscious fear reaction, perhaps because of the fact that the defense mechanism is so mobilized by the threat of operation or anesthesia that the anxiety takes on an entirely individual character which is dependent on the pre-existing psychic situation. Oral surgeons have observed that sometimes their patients show less fear and anxiety before a major operation than they do before dental operations.

During his treatment of emotional disturbances through hypnosis, Guze[34] uncovered many instances of mental trauma in patients who had been inadequately prepared for anesthesia. Straker[35] gives a report of a number of emotionally disturbed patients who dated the onset of disturbance as coinciding with an operation for which they were poorly prepared. Freud[36] was the first to suggest that such reactions were the result of an unanticipated danger in which the psychic life is overwhelmed by sudden great excitement

31. Hoch, P. H., and Zubin, Joseph. Anxiety. New York, Grune & Stratton, 1950, p. 107.

32. Rosen, V. H. Psychiatric problems in general surgery. In Psychology of physical illness, L. Bellak, editor. New York, Grune & Stratton, 1952.

33. Deutsch, Helene. Some psychoanalytic observations in surgery. Psychosom. Med. 4:105 Jan. 1942.

34. Guze, H. Anesthesia and instrumentation trauma as revealed in hypnotherapy. J. Clin. & Exper. Hyp. 1:71, 1953.

35. Straker, M. Surgical procedures and neurotic illness. Canad. M.A.J. 65:128 Aug. 1951.

36. Freud, S. The problem of anxiety. New York, W. W. Norton & Co., 1936.

in response to a flood of abrupt, new stimuli, without the possibility of an inner struggle to mobilize defense. This occurrence is more common in children who only too rarely receive adequate preanesthetic preparation, but it is not at all uncommon in adults as well.

A factor lost sight of in the concern for the patient is the fear and anxiety in the dentist himself.[37,38] This state of fear and anxiety, often overt or concealed, is most commonly present in dentists who fear that they do not know enough about the subject of anxiety in their own patients and who perhaps are not able to make use of all available evidence to determine a theory and then to put it in practice.

As a result, they tend to become insecure and develop professional phobias. They appear always to apply the same concepts and therapeutic measures. Any attempt to persuade them to change their attitude toward dental procedures serves as a threat to their organized defense mechanisms. Physically and mentally, they pay a high price for this type of defense. In order to handle the patient's fears and anxiety, the dentist must have his own fears well resolved.

Herein may lie one of the factors responsible for the difference of opinion concerning premedication for the ambulatory patient. A patient who has received considerable premedication presents less of a threat to the emotionally insecure operator than does the more wide-awake patient.

PSYCHOTHERAPY

Every rational patient about to receive an anesthetic before an operation has considerable concern regarding the event. The preanesthetic period should be considered, not as the period immediately preceding the induction of anesthesia, but rather as beginning from the moment the patient is told that an operation is to be performed and an anesthetic will be required. The shorter this period, the less will be the cumulative anxiety.

It is easy for the lay person to associate the loss of consciousness and surrender of his body to the control of another as a form of death and to feel all the uneasiness brought about by coming in contact with the unknown. This state of mind has the profound sympathy of any anesthetist who is in a position to realize how erroneous the patient's concepts really are. Since, however, this situation repeats itself many hundreds of times for the average anesthetist, he tends to consider only his routine duties and to forget entirely about the patient as a person.

Psychotherapy may range from an admonition to be quiet and behave oneself, a slap on the back or a hearty "You'll be all right" to the extreme of hypnosis.[39-43] The time available often makes it impossible to prepare the patient psychologically as fully as desirable, but every opportunity to do so should be utilized. Because an operation has to be faced only once or twice in a lifetime, it is sometimes justifiable to take the course, less satisfactory in theory, of using a sedative drug even when it is not absolutely necessary. The anesthetist, however, should learn to recognize the type of patient immediately and to decide quickly whether the anesthesia is likely to be easy or difficult.

The fear reaction, which is an essential factor in biological survival, consists of a complicated series of changes which pre-

37. Raginsky, B. B. Some psychosomatic aspects of general anesthesia. Anesthesiology 11:391 July 1950.

38. Raginsky, B. B. Hypnosis in internal medicine. In Hypnosis in modern medicine, J. M. Schneck, editor. Springfield, Ill., Charles C Thomas, 1953, p. 28-60.

39. Raginsky, B. B. Psychosomatic medicine; its history, development and teaching. Am. J. Med. 5:857 Dec. 1948.

40. Raginsky, B. B. Mental suggestion as an aid in anesthesia. Anesthesiology 9:472 Sept. 1948.

41. Raginsky, B. B. Hypnotism and its relation to anesthesia. J. Connecticut M. Soc. 2:527 Nov. 1938.

42. Raginsky, B. B. The use of hypnosis in anesthesiology. Personality, symposia on topical issues 1:340, 1951.

43. Raginsky, B. B. L'approche psychosomatique en art dentaire. J. Canadian D.A. 18:669 Nov. 1952

pares the individual to resist the incident evoking fear. He may do this in any one or a combination of three ways: (1) fight, if necessary, with physical violence; (2) run away; (3) give in to his dependency needs and submit as a child who asks to be taken into his mother's arms when he is frightened. Psychotherapy should be directed toward minimizing the "fight or flight" mechanism in a patient.

Jackson,[44] in discussing the psychological preparation as a method of reducing the emotional trauma of anesthesia in children, suggests the telling of stories, playing music, impregnating the face mask with pleasant-smelling substances and "pretending." In her opinion, this procedure is part of the art of anesthesia, although it does not lend itself to reports for scientific journals. As premedication for a tonsillectomy she uses secobarbital (Seconal) or pentobarbital (Nembutal) two hours before the operation. Douglas[45] recommends the "suggestive" therapy of music in addition to a premedicant.

There is considerable literature available to provide a broader understanding of psychotherapy for nonpsychiatrists; much of it would be helpful to dentists and physicians.[46-50]

All professional men, especially those in the medical sciences, make some use of the psychosomatic approach; that is to say, they try to understand the emotional elements involved in any disordered state whether it is emotional or organic. Such understanding is especially important for dental practitioners, since the emotional disturbance in dental patients is usually especially acute and therefore usually evident.

Many practitioners pride themselves on their ability to recognize emotional elements and particularly their ability to manage them. In actual practice, however, few practitioners are orientated or trained adequately to handle the emotional aspects of the conditions they treat. All too often they do not and cannot recognize the psychodynamics or the psychophysiological processes involved. Before psychotherapy is attempted, therefore, the literature on the psychosomatic aspects of dentistry should be studied. Fortunately, the sources now are adequate.[2, 46, 51-53]

Just as a dentist would not expect to make an adequate dental diagnosis without first having been trained in anatomy, physiology, pathology, chemistry and allied subjects, so the dentist or the anesthetist cannot expect to use psychotherapy without first having studied the broad patterns of human behavior, motivation, personality development, adaptations and maladaptations. The physical and physiological changes brought about by emotional attitudes are an integral part of psychosomatic dentistry. With this knowledge, a dentist is in a better position to allay the fears and anxieties of the average dental patient.

The most forceful method for allaying anxiety without recourse to medication is the use of hypnosis. Hypnosis covers an extremely broad field; its use in dentistry is restricted to only two minor purposes: to allay apprehension and anxiety and occasionally to produce anesthesia. Broader use of hypnosis by the average dentist may lead to difficulties. There is considerable literature on the use of

44. Jackson, Katherine. Psychologic preparation as a method of reducing emotional trauma of anesthesia in children. Anesthesiology 12:293 May 1951.

45. Douglas, B. L. Use of wire recorder in anesthesia. Anesth. & Analg. 32:71 Jan.-Feb. 1953.

46. Stenfield, C. E. Psychotherapy: an orientation for non-psychiatrists. Am. J. Med. Sc. 216:97 July 1948.

47. Weiss, E. Psychotherapy in everyday practice. J.A.M.A. 137:442 May 29, 1948.

48. Ziskind, E. Training in psychotherapy for all physicians. J.A.M.A. 147:1223 Nov. 24, 1951.

49. Whitehorn, J. C. Basic psychiatry in medical practice J.A.M.A. 148:329 Feb. 2, 1952.

50. Wolff, H. G. Protective reaction patterns and disease. Ann. Int. Med. 27:944 Dec. 1947.

51. Campbell, D. G. Psychosomatic mechanism in oral diseases. Am. J. Orthodont. & Oral Surg. (Oral Surg. Sect.) 31:440 July 1945.

52. Stolzenberg, J. Psychosomatics and suggestion therapy in dentistry. New York, Philosophical Library, Inc., 1950.

53. Roth, H., and Stone, A. Psychosomatic and nutritional factors related to recurrent necrotizing ulcerative gingivitis. J.A.D.A. 42:474 April 1951.

hypnosis in dentistry.[54-61] More general aspects of the subject can be found in the medical literature.[62-65]

Although the allaying of anxiety and the production of anesthesia are spectacular phenomena of hypnosis, as a matter of fact, these are among the least important of its uses. Through hypnosis the patient's conscious and unconscious resistances can be dealt with, psychological material which otherwise might appear hazy and disconnected can be clarified, emotions can be brought into more normal relationship with the personality, and finally, suggestions can be made for treatment. The practitioner who uses hypnosis, however, must be as adept in the use of this tool as the surgeon is with the scalpel; otherwise, failure and damage may ensue.

A further word of caution is necessary concerning an effect which has not been stressed in the literature. Even when hypnosis is used with care only for allaying anxiety or for producing anesthesia, the procedure may produce a variety of random effects; more important still, it may release pent-up emotional conflicts. Just as any surgeon who plans to open an abdomen must be trained to treat any condition he may find, so the dentist who uses hypnosis must have adequate training before he uses it. Hypnosis as managed by the properly trained practitioner can have a decidedly salutary effect on the patient.

Ignorance and misuse of hypnosis have led to considerable acrimony. Though the writer of an editorial in THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION acknowledged the value of the "art" of suggestion for dental patients, he questioned its use to the extent of hypnosis.[66] It is the consensus of those who use hypnosis that it is difficult, if not impossible, to draw a distinction between the two or to determine a point at which suggestion ends and hypnosis begins.

The Society for Clinical and Experimental Hypnosis was founded in 1949.[67] Its membership is limited by its high professional standards, modeled on the general requirements of the American Medical Specialty Boards, the American Psychological Association and the American Medical Association. Specific requirements have been established as to the quality of clinical work and published research related to hypnosis. The publication of the *Journal of Clinical and Experimental Hypnosis* is a direct outgrowth of the development and activity of this Society.

Scientific hypnosis today can stand on its own merits in respect to its methodology, significance and usefulness. It is a tool which aids workers in the behavior sciences to view the individual's personality as a whole.[68] The fact that most of the research work in this field is now done in connection with universities bodes well for its acceptance. As mentioned at the outset, in the matter of "dental psychosomatics" and "hypnodontia," at times "tender-minded" scientists seem to be in the ascendancy; they have done much

54. Weinstein, J. H. Hypnosis in dentistry. In Hypnosis in modern medicine. J. M. Schneck, editor. Springfield, Ill., Charles C Thomas, 1953, p. 209-245.

55. Moss, A. A. Hypnodontics, or hypnosis in dentistry. Brooklyn, Dental Items of Interest Publishing Co., 1952.

56. Marcuse, F. L. Hypnosis in dentistry. Am. J. Orthodont. & Oral Surg. (Oral Surg. Sect.) 33:796 Nov. 1947.

57. Heron, W. T. Clinical applications of suggestion and hypnosis. Springfield, Ill., Charles C Thomas, 1950.

58. Ament, P. Relaxation of excitable patients with hypnosis. J. D. Med. 3:70 July 1948.

59. Ament, P. Stress removal in dental practice with hypnodontics. J. D. Med. 7:114 Oct. 1952.

60. Rosen, H. The hypnotic and hypnotherapeutic control of severe pain. Am. J. Psychiatry 107:917 June 1951.

61. Heron, W. T. Dental hypnosis and personality. Personality, symposia on topical issues 1:349, 1951.

62. Schneck, J. M. Hypnosis in modern medicine. Springfield, Ill., Charles C Thomas, 1953.

63. Wolberg, L. R. Medical hypnosis. New York, Grune & Stratton, Inc., 1948.

64. LeCron, L. M., editor. Experimental hypnosis. New York, Macmillan Co., 1952.

65. Rosen, H. Hypnotherapy in clinical psychiatry. New York, Julian Press, Inc., 1953.

66. Hypnosis in dentistry is extremely impractical. Editorial. J.A.D.A. 40:590 May 1950.

67. Schneck, J. M. Outline of development of Society for Clinical and Experimental Hypnosis. J. Clin. & Exper. Hyp. 1:2, 1953.

68. Kline, M. V. Editorial note. J. Clin. & Exper. Hyp. 1:1, 1953.

to retard the acceptance of the principles of hypnosis. Nevertheless, it appears that psychotherapy will have a place in dentistry of the future.

SUMMARY

The administration of general anesthesia in the dental office is a service to the public.[69] An extension of this service is the attempt to reduce the anxiety and apprehension of the ambulatory dental patient who is to receive an anesthetic. For this purpose most dentists use premedicant drugs, a minority use only psychotherapy in routine cases; all dentists use a combination of both in exceptional cases.

The personality make-up of the anesthetist or the dentist will determine whether he is constituted to be patient, sympathetic and emphatic toward his patients or whether through personality and training he is inclined to employ chemotherapy and thus spare himself the stress and strain involved in the patient-practitioner relationship.

An understanding of the mechanisms of apprehension, anxiety and fear is essential in order to deal with the dental patient who is about to receive an anesthetic. In the various methods of reducing these symptoms by means of psychotherapy, suggestion and hypnosis do and will have a place.

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69. Clement, F. W. Training in dental anesthesia. J. Oral Surg. 10:312 Oct. 1952.

Profits from False Advertising • There is a new kind of practitioner coming into prominence in the advertising business. These are the tongue-in-cheek boys who believe that it is supremely clever to beat the Federal Trade Commission on an advertising claim. These clever boys have developed this game to a science, or perhaps we should call it a fine art, where they can estimate within a hair's breadth how far they can go with deliberately misleading statements and how long it would take before they are cited. These men believe that if they can get an advertising leeway of two or three months with a false statement, they can register this sufficiently in the minds of the consumer and so pass on to something else. When finally picked up by the FTC, these men put up no fight at all. With wide-eyed innocence, they meekly sign a stipulation to cease and desist printing the misleading advertising statement.

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Statistical and morphological analysis of four hundred and one cases of intraoral squamous cell carcinoma

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Squamous cell carcinoma of reasonably accessible areas—cervix, breast, rectum, mouth and skin—accounts for nearly 50 per cent of cancer deaths among women and 25 per cent among men.[1] Intraoral lesions alone are responsible for approximately 3 per cent of all cancer deaths.[2] Widespread interest in the problem of malignant neoplastic disease of the oral regions has prompted a series of studies, of which this is one, at the Armed Forces Institute of Pathology. Others have dealt with carcinoma of the lip[3] and malignant epithelial tumors of the nasopharynx.[4]

The present report is concerned with a statistical and morphological study of 401 cases of intraoral squamous cell carcinoma selected from approximately 800 received at the Armed Forces Institute of Pathology up to and including January 31, 1951. The 399 cases regarded as unacceptable were those with inadequate clinical histories or poor tissue specimens. The sources of this material include the Veterans Administration Hospitals, civilian hospitals and practitioners, as well as the Armed Forces. Because of this the age range is great, and in this respect is comparable to that in reports based solely on the civilian population. The statistics concerning sex distribution are, however, biased because of the predominantly male source of the material.

Clinical records of hospitalization were obtained and replies to follow-up inquiries were received on 379 (95 per cent) of the 401 cases from patients or their physicians. The information tabulated covered such points as duration of symptoms before the patient consulted physician or dentist, subsequent time elapsing before treatment for cancer, age, sex, treatment, present status, history of systemic disease, use of tobacco, primary site, possible etiologic factor, appearance and size of initial lesion, metastasis and local extension.

Histologic features which were recorded included the degree of surface keratinization, degree of ulceration, type

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1. Cameron, C. S. Cancer: retrospect and prospect. Oral Surg., Oral Med. & Oral Path. 6:11 Jan. 1953.

2. Lawrence, E. A., and Brezina, P. S. Carcinoma of the oral cavity. J.A.M.A. 128:1012 Aug. 4, 1945.

3. Bernier, J. L., and Clark, M. L. Squamous cell carcinoma of the lip: critical statistical and morphological analysis of 635 cases. Mil. Surgeon 109:379 Oct. 1951.

4. Scofield, H. H. Epidermoid carcinoma of nasal and pharyngeal regions: a statistical and morphological analysis of two hundred and fourteen cases. Thesis, Georgetown Univ., Washington, D. C., June 1952.

and density of inflammation, and area of involvement; the form and pattern of growth of the tumor cells, invasion of bone, muscle or glandular tissue, and the relative grade of malignancy (Broders' grading of carcinoma).[5]

Throughout the presentation of the cases in this series, the data are compared point by point with the observations published in previous reports by other investigators.

PREVALENCE OF TUMOR

Since the first case of "lingual" carcinoma reported by Reade in 1635,[6] thousands of cases of intraoral squamous cell carcinoma have been recorded, and today statistics indicate that it is responsible for approximately 3 to 5 per cent of all cancer deaths.[2] Others[7] have placed the percentage as high as 10 per cent.

Thoma[8] observed that squamous cell carcinoma is the most common malignant tumor in the oral cavity, and Jorstad[9] stated that it comprises the greatest number of malignant neoplasms of the buccal mucosa. In a survey at the Columbia Presbyterian Medical Center, Archer and Morris[10] found that of 203 cases of intraoral neoplasms, 199 were squamous cell carcinoma, 3 cylindromatous carcinoma, and 1 adenocarcinoma. Of 305 cases of intraoral cancer with biopsy, reviewed by Gibbel, Cross and Ariel,[11] 95.7 per cent were squamous cell carcinoma and 4.3 per cent were transitional cell carcinoma.

GENERAL CONSIDERATIONS

Three hundred and fourteen (78 per cent) of the patients in this series of 401 were hospitalized during the years 1940-1949, and 44 (11 per cent) during 1950. Thirty-two (8 per cent) were treated during 1935-1939, and only 11 (3 per cent) prior to 1935.

Definite follow-up information subsequent to hospitalization was obtained for 379 of the 401 patients. Of these, 133 (35 per cent) were living at the time of last report.

LOCATION OF TUMOR

The primary lesion may occur anywhere in the mouth with the exception of the dorsum of the middle third of the tongue immediately in front of the lingual V. In 1,500 cases at Memorial Hospital,[11,12] no carcinoma was found in this area. In general, however, the tongue is the most common site of primary carcinoma in the mouth. In specifying the location of the tumor three divisions of the tongue are recognized: base, anterior one third, and posterior one third. Although the base of the tongue is often mentioned[13,14] as being the most frequent site, others[13] state that the edge of the tongue in its middle third is the most common location.

More than one half (207) of the carcinomas in our study were located in the tongue. The site of next greatest frequency was the floor of the mouth with 63. Forty-nine were located in the alveolar mucosa, 44 in the palate and 38 in the buccal mucosa (Table 1). These figures are comparable with those found in the literature. The base of the tongue was recorded as the primary site in the largest number of tongue lesions (63).

5. Broders, A. C. The grading of carcinoma. Minnesota Med. 8:726 Dec. 1925.

6. Martin, H. E. History of lingual cancer. Am. J. Surg. 48:703 June 1940.

7. Paterson, R. Cancer of the mouth. Post-Grad M.J. 17:89 June 1941.

8. Thoma, K. H. Oral pathology, ed. 3. St. Louis, C. V. Mosby Co., 1950, p. 1518.

9. Jorstad, L. H. Diagnosis, treatment and prognosis of carcinoma of buccal mucosa. South. M.J. 35:970 Nov. 1942.

10. Archer, W. H., and Morris, R. D. A survey of oral carcinoma at the Columbia-Presbyterian Medical Center. Am. J. Orthodont. & Oral Surg. (Oral Surg. Sect.) 32:338 June 1946.

11. Gibbel, M. I.; Cross, J. H., and Ariel, I. M. Cancer of the tongue: a review of 330 cases. Cancer 2:411 May 1949.

12. Martin, H. E.; Munster, H., and Sugarbaker, E. D. Cancer of the tongue. Arch. Surg. 41:888 Oct. 1940.

13. Khanolkar, V. R. Oral cancer in Bombay, India: a review of 1 000 consecutive cases. Cancer Research 4:313 May 1944.

14. MacFee, W. F. Concealed cancer of the tongue. Ann. Surg. 93:481 Feb. 1931.

The posterior two-thirds of the tongue alone or in combination was the second most frequent location.

Tongue • The patients with primary carcinomas in the tongue appeared to differ from those with tumors in other regions of the mouth with respect to age, the presence of lymph node involvement, the presence or absence of subsequent lesions, and survival rates. These patients were, on the average, approximately 5 years younger than those with lesions in the other four areas. The mean age for those with carcinoma of the tongue was 53 years; floor of mouth, 57 years; buccal mucosa, 58 years; palate, 58 years; and alveolar mucosa, 59 years.

Table 1 • Primary site of tumor

Primary site	Number	Per cent
Total	401	100.
Buccal mucosa	38	9.
Buccal mucosa, not further specified	4	
Buccal mucosa, right	13	
Buccal mucosa, left	21	
Floor of mouth	63	16.
Floor of mouth, not further specified	28	
Anterior ⅓	24	
Posterior ⅔	10	
Entire floor of mouth	1	
Tongue	207	52.
Tongue, not further specified	49	
Anterior ⅔	24	
Posterior ⅔	43	
Anterior ⅔, posterior ⅔	11	
Base of tongue	63	
Ventral surface*	12	
Dorsal surface*	4	
Dorsal and ventral surface*	1	
Palate	44	11.
Palate, not further specified	6	
Hard	13	
Soft	20	
Hard and soft	5	
Alveolar mucosa	49	12.
Alveolar mucosa, not further specified	2	
Maxillary	2	
Maxillary, buccal surface	7	
Mandibular	22	
Mandibular, buccal surface	6	
Mandibular, lingual surface	10	

*Includes cases with surface specified only.

The regional lymph nodes of 58 per cent of patients with carcinomas of the tongue were involved at the time of treatment. This high figure is no doubt due in part to the abundant lymphatic drainage of the area. Corresponding percentages for other sites were somewhat lower. Lymph node involvement had occurred in 45 per cent of the patients with carcinoma of the buccal mucosa, 42 per cent of those with carcinoma in the floor of the mouth, 41 per cent with carcinoma of the alveolar mucosa, and 37 per cent with carcinoma of the palate.

The locations of metastatic lesions were reported for 230 patients (Table 2). Nineteen per cent with carcinoma of the tongue had distant metastases, as compared to 38 per cent if the tumor was primary in the buccal mucosa, 15 per cent if in the floor of the mouth, and 15 per cent if in the alveolar mucosa. When the palate was the initial site, the percentage with distant metastases was lower (4 per cent) than for any other location.

The three-year survival rate was somewhat lower for patients with primary car-

Table 2 • Location of lesion in relation to location of metastasis

Location of lesion	Total no.	Location* of metastasis		
		Local	Lymph nodes	Distant
		Number		
Total with information	230	153	163	42
Buccal mucosa	21	9	14	8
Floor of mouth	34	19	22	5
Tongue	132	90	100	25
Palate	23	21	13	1
Alveolus	20	14	14	3
		Per cent†		
Total with information	230	66.	71.	18.
Buccal mucosa	21	43.	67.	38.
Floor of mouth	34	56.	65.	15.
Tongue	132	68.	76.	19.
Palate	23	91.	56.	4.
Alveolus	20	70.	70.	15.

*Locations of metastasis were specified for 230 or 98 per cent of the 235 patients with reported metastases. Five histories of dead patients recorded metastases but no information as to location.

†Percentages add to more than 100 since some of the 230 patients had metastasis involving more than one site.

Table 3 • Survival rate of patients with lesions in the tongue in relation to all other sites* and to lymph node involvement

Interval (Months)	Survival rate (Per cent)					
	Total		No involvement		Involvement	
	Tongue	Other sites	Tongue	Other sites	Tongue	Other sites
0 – 5	100.	100.	100.	100.	100.	100.
6 –11	78.	82.	87.	89.	71.	74.
12–17	51.	64.	72.	72.	36.	53.
18–23	37.	47.	66.	57.	19.	36.
24–29	30.	39.	53.	53.	13.	21.
30–35	24.	36.	48.	50.	9.	15.
36 and over	22.	30.	42.	42.	7.	11.

*All other sites include buccal mucosa, floor of mouth, palate and alveolus.

Table 4 • Location of lesion in relation to size

Location	Total	Size of lesion (Cm.)			
		0.1-1.0	1.1-2.0	2.1-3.5	3.6-8.0
		Number			
Total	216	57	56	38	65
Buccal mucosa	19	7	6	4	2
Floor of mouth	29	12	8	7	2
Tongue	117	27	32	21	37
Palate	24	5	5	1	13
Alveolar mucosa	27	6	5	5	11
		Per cent			
Buccal mucosa	100.	37.	32.	21.	10.
Floor of mouth	100.	41.	28.	24.	7.
Tongue	100.	23.	27.	18.	32.
Palate	100.	21.	21.	4.	54.
Alveolar mucosa	100.	22.	19.	19.	40.

cinoma in the tongue than for other locations. Only 22 per cent of the patients with tongue carcinomas survived three years or longer whereas 30 per cent of those with tumors in other locations survived the same length of time (Table 3).

In the cases where there was no metastasis to lymph nodes, the survival rate of patients with carcinoma of the tongue was the same as that of patients with primary tumors in any of the other locations. Where there was lymph node involvement, however, the three-year survival rate was lower for patients who had a primary carcinoma in the tongue.

TYPE OF TUMOR

Goldman[15] described two forms of intraoral squamous cell carcinoma, one of which is depressed below the surface, its edges raised, its surface fissured, and its base necrotic; the other exhibits slight mucosa ulceration and deep submucosal induration. Steiner[16] described two types of carcinoma of the tongue: a soft, cauliflower, papillary type and an ulcerating lesion with progressive excavation and destruction.

The initial form of the lesion was described by the dentist, physician or patient as an ulcer in 60 per cent of our cases, and simply as a growth in 30 per cent. Inflammation, keratosis, and swelling accounted for primary manifestations in approximately 10 per cent.

It is possible and highly probable that a number of patients who reported with an ulcer as the initial form of the carcinoma had previously experienced minor symptoms which they did not consider serious or of which they were unaware until ulceration or pain occurred.

SIZE OF TUMOR

The size of the lesion had been recorded in 54 per cent of the cases in this study. In the majority this figure was expressed in two dimensions, but since in most cases it was not stated whether these were length, width or depth, in the interests of uniformity the lesions have been classified according to the longer measurement.

The primary lesions when first seen ranged in size from a few millimeters to as much as 8 centimeters. Carcinomas of the palate were usually large and those in the floor of the mouth were often small, whereas tongue lesions occurred with equal frequency in all sizes (Table 4).

15. Goldman, L. B. Cancer and the dentist. J.A.D.A. 42:371 April 1951.

16. Steiner, B. E. Carcinoma of the tongue. J. Christian M.A. 25:338 Nov. 1950.

By use of the actuarial method it was postulated that 89 per cent of the patients with lesions of 1 cm. and less would be living at the end of 6 months, whereas only 66 per cent with lesions of 3.6 to 8.0 cm. would live for as long a time (Fig. 1). This is a difference of 23 per cent. At the beginning of two years, 28 per cent of those with initial large lesions would be alive as compared to 42 per cent with small lesions. This is a difference of 14 per cent.

AGE DISTRIBUTION

The average age of patients with intraoral carcinoma varies widely. Cade[17] observed that younger age groups (third and fourth decades) were affected more often. In approximately 82 per cent of 203 cases reviewed by Archer and Morris[10] the patients were between the ages of 45 and 74. Padgett[18] found that the majority of patients were from 40 to 60 years of age with the maximum number in the fifth decade; Gibbel and associates[11] computed 53 years as the mean age of 330 patients. Jorstad[9] gave 62 to 65 years as the range of greatest prevalence for cancer of cheek.

The ages at the time of hospitalization of 393 (98 per cent) of the 401 patients were recorded. The mean age of the total group, irrespective of location of the tumor was 55 years, with 76 per cent of patients between the ages of 40 and 69 years, inclusive. The youngest patient was 20 and the oldest, 87 years of age. As already noted, patients with carcinoma of the tongue were younger than those with lesions in the other four locations.

SEX DISTRIBUTION

The sex distribution of intraoral squamous cell carcinoma as reported is more constant and, in general, from 85 to 90 per cent occur in men and between 10 and 15 per cent in women.[19] Cade[17] reported that 30 per cent of his patients in England were women, and that the incidence among Swedish women was approximately 40 per cent. Lawrence and Brezina[2] reported 145 cases, 12 per cent of them among women, which is in line with the figures given by Archer and Morris,[10] 15 per cent of 203 cases; Perry and Cameron,[20] 10.5 per cent of 95 cases, and Martin and associates, [12] 13 per cent of 556 cases. Fraser[21] gave the ratio of males to females as 8 to 1, and Jorstad[9] as 6 to 1.

Of the 401 patients in this study 96 per cent were males and 4 per cent females. This low figure for females no doubt shows a bias caused by predominantly

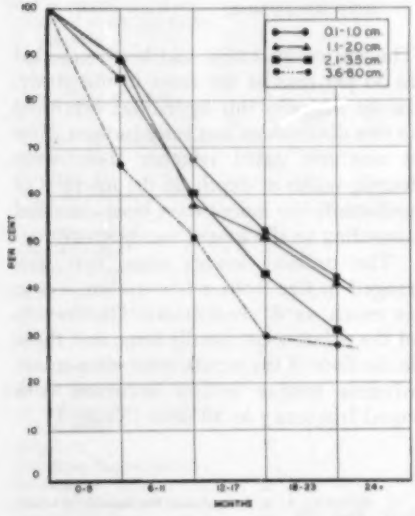

Fig. 1 • Survival rate of patients with lesions of specific sizes

17. Cade, S. Malignant disease and its treatment by radium, v.4, ed. 2. London, Simpkins Marshall, Ltd., 1952.

18. Padgett, E. C. Oral epidermoid carcinoma: general considerations and etiologic factors. Internat. J. Orthodont. & Oral Surg. 22:283 March 1936.

19. James, A. G. Cancer of the tongue. Ohio State M.J. 46:1184 Dec. 1950.

20. Perry, T., Jr., and Cameron, E. S. Epidermoid carcinoma of the tongue: a study based on 95 cases. Rhode Island M.J. 32:663 Dec. 1949.

21. Fraser, J. Carcinoma of the mouth and tongue. Ann. Surg. 96:488 Oct. 1932.

male population of the military group from which the majority of cases came. The average sex distribution as given by other authors varies from 10[16] to 30 per cent[17] for females, depending on the geographic location, the lowest incidence being among American women.

Table 5 • Use of tobacco

Use of tobacco	Number	Per cent
Total with information	250	100.
Nonusers	13	5.
Users of tobacco	237	95.
Cigarettes	154	65.
Pipes	45	19.
Cigars	24	10.
Chewing tobacco	14	6.

ETIOLOGIC FACTORS

The etiology is complex and only the factors most often mentioned have been given consideration in our analysis, although even the importance of those factors may be questioned.

Use of Tobacco • Smoking has long been considered a factor in lip and intraoral carcinoma. Gibbel and co-workers[11] reported that 58.1 per cent of their patients were moderate, and 9.4 heavy users of tobacco; 9 per cent did not smoke, and in 24 per cent there was no report concerning smoking habits. English[22] suggested that credence be given pipe smoking as an etiologic factor when the lesion arises where the pipe habitually rests in the smoker's mouth. Fraser,[21] in a series of 105 cases, reported that 65 of the 88 men were heavy pipe smokers and none of the other 13 was a nonsmoker.

Information as to use of tobacco was available on 250 of the 401 patients in this series, 95 per cent used tobacco in one form or another (Table 5). Nineteen per cent smoked pipes, 10 per cent smoked cigars, 65 per cent smoked cigarettes, and the remaining 6 per cent chewed tobacco. Since the large percentage of the male population does use tobacco in one form or another, however, no definitive conclusions can be drawn from this.

Survival rates of those who used tobacco and those who did not were computed and although the number involved was so small as to be statistically of no significance it is nonetheless interesting to note that for separate periods of 6, 12, 18 and 24 months, the survival rate was higher for those who used tobacco than for those who did not.

Syphilis • Syphilis is regarded as an important factor by some who cite it as a chief etiologic factor in carcinoma of the tongue. Gibbel and co-workers[11] reported that 21.8 per cent of their patients with lingual cancer had syphilis, and Martin and co-workers,[12] 33 per cent. Kaplan[23] stated that syphilis is a concomitant disease in 40 to 50 per cent of all oral cancer. Fraser[21] placed the incidence of syphilis in cases of cancer of the tongue as a whole at 42.3 per cent and of cancer of the dorsal surface at 78.3 per cent. Lund[24] found evidence of syphilis in 17 per cent of 401 patients with carcinoma of the tongue, and stated that in relation to oral carcinoma, the highest incidence of syphilis was in patients with cancer of the tongue. Schreiner and Brown[25] reported that 35 per cent of their patients with carcinoma of the tongue had a positive Wassermann reaction on admission, and 16 other patients gave a history of venereal disease although the Wassermann test was negative. Cade[17] pointed out the importance of obvious long-

22. English, J. Cancer of the tongue: a review of the literature and summary of two cases, with clinical histories and necropsy findings. Oral Surg., Oral Med. & Oral Path. 2:231 Feb. 1949.

23. Kaplan, I. I. Cancer of the floor of the mouth. J.A.D.A. 30:737 May 1, 1943.

24. Lund, C. C. Epidermoid carcinoma of the buccal mucosa. Surg., Gynec. & Obst. 66:810 April 1938.

25. Schreiner, B. F., and Brown, H. F. R. Results obtained in cancer of the tongue treated by radium and roentgen rays. Am. J. Roentgenol. 15:207 March 1926.

Table 6 • Survival rate of treated patients with evidence of syphilis at admission in relation to survival rate of patients without syphilis

Months	Survival rate (Per cent)	
	Neg. ser. or no hist.	Positive serology
0–5	100.	100.
6–11	84.	73.
12–17	61.	49.
18–23	45.	24.
24 and over	36.	19.

standing syphilitic change in the oral mucosa as a predisposing factor in the development of cancer. This, in our opinion, is deserving of serious consideration.

Sixty-four (18 per cent) of our 348 patients with recorded data had a history of syphilis or reacted positively to serologic tests for syphilis at time of hospitalization. The Wassermann reaction was positive in 44 and 20 had a previous history of syphilis. This percentage represents a considerably higher incidence of syphilis than in the total United States population (estimated at approximately 5 per cent).

Duration from time of treatment to last known status was known for 42 of these patients in whom the Wassermann test was positive and the survival rate indicated that they had less chance to live than those who had no history of syphilis (Table 6). On the basis of these findings it is postulated that of 100 persons with intraoral carcinoma and a positive serologic reaction, 19 may be expected to live two years or more, whereas 36 of a similar number who have not had syphilis will live two years or more.

It was noted, however, that most of the carcinomas in the 42 patients were of Broders' Grade II and Grade III, which corresponded to the proportion of carcinomas of similar grades in the entire group, and suggests that the degree of malignancy is not greater in association with syphilis.

Leukoplakia • Some authors regard leukoplakia as the chief precursor of carcinoma in the oral cavity. However, it is obvious that many investigators make the diagnosis of leukoplakia on clinical appearance (a white patch) rather than on the histologic features of the lesion. In this report the term pachydermia oralis is used to differentiate the lesion from leukoplakia because dyskeratosis, which is considered a prerequisite for the pathological diagnosis of leukoplakia, could not be demonstrated in any of the cases in which a white patch represented the initial lesion.

Trauma, cuts, jagged teeth, ill fitting dentures, and various other conditions are also considered predisposing factors and are mentioned as such in nearly all reports.

Heredity • Seven per cent of 216 patients stated that there was a family history of intraoral carcinoma, 23 per cent gave a family history of carcinoma other than intraoral, and 70 per cent had no knowledge of carcinoma in the family. No significance is attached to these data.

DURATION AND DIAGNOSIS

Interesting among the clinical findings was the period of time that elapsed between onset of symptoms and initial treatment for the carcinomatous lesion. This was greatly influenced by whether a correct diagnosis was made at the time of first visit and perhaps by the period be-

Table 7 • Average length of time from onset to first visit to physician or dentist and from first visit to treatment for carcinoma

Treatment	Months	
	Correct diagnosis	Incorrect diagnosis
From onset to first visit to physician or dentist	4.2	2.6
From first visit to treatment for carcinoma	1.1	4.7

tween onset of symptoms and the time when the patient sought care.

Those patients who received a correct diagnosis at the time of their first visit received treatment for their tumor on an average of 1.1 month later. When the diagnosis was incorrect initially the period was 4.7 months. Those in the first group waited 4.2 months before seeking aid and those in the latter group 2.6 months. The sum of these two periods of time amounted to 5.3 months for the first group and 7.3 months for the second, a difference of 2 months (Table 7). There were 24 per cent more 2 year survivals in cases correctly diagnosed initially as is shown in Figure 2.

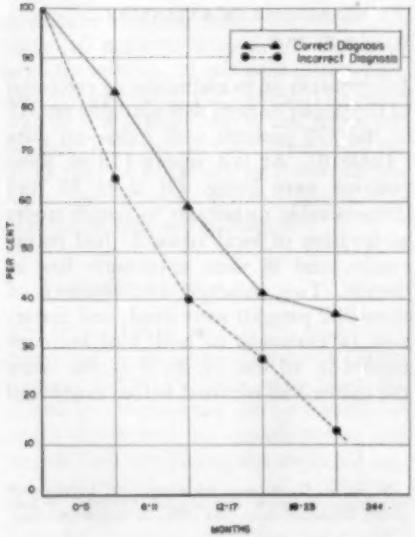

Fig. 2 • Survival rate of patients with lesions correctly and incorrectly diagnosed

TREATMENT

The treatment of cancer of the tongue has been widely discussed. According to James,[19] treatment depends on the size and location of the tumor and whether

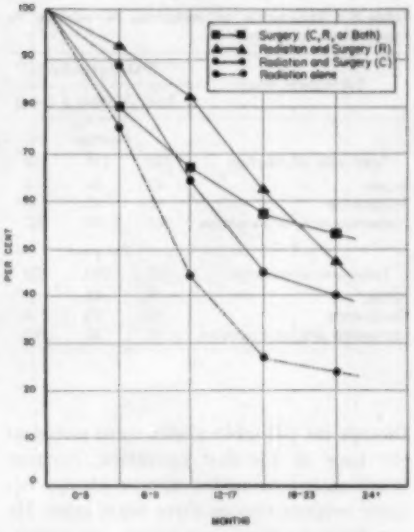

Fig. 3 • Survival rate of patients with intraoral squamous cell carcinoma in relation to type of treatment

or not there is lymph node involvement. He recommended radiation to the base of the tongue and surgical treatment with or without radiation to the rest of the tongue. Garland and Sisson,[26] in a series of 71 patients with carcinoma of the tongue, observed that about 50 per cent of the lesions in the anterior two-thirds were controlled by radiation if the nodes were not involved, but only about 15 per cent if the nodes were involved. In their experience, the lesions in the posterior two-thirds of the tongue were seldom successfully treated. Orton,[27] in treatment of cancer of the tongue, advocated block dissection of the neck even

26. Garland, L. H., and Sisson, M. A. Results of irradiation in cancer of the lip, tongue and ear. California Med. 73:312 Oct. 1950.

27. Orton, H. B. Symposium: malignant tumors; malignant neoplasms of the tongue, tonsils and hypopharynx: evaluation of surgical treatment. Tr. Am. Acad. Ophth. 55:226 Jan.-Feb. 1951.

Table 8 • Recurrence or metastasis in relation to known status of patient

Subsequent lesion	Status of patient		
	Total	Alive	Dead
	Number		
Total with information	332	118	214
None	62	56	6
Recurrence	35	27	8
Metastasis and/or extension	235	35	200
	Per cent		
Total with information	100.	100.	100.
None	19.	47.	3.
Recurrence	10.	23.	4.
Metastasis and/or extension	71.	30.	93.

though no palpable nodes were noted at the time of the first operation, because involvement of nodes almost always became evident two or three years later. He regarded surgical procedure as contraindicated if the lymph nodes below the omohyoid muscle were palpable, if the cervical nodes along the carotid vessel were firmly attached, and if there was also distant metastasis. Of 62 cases treated for cure by Perry and Cameron,[20] 47 were treated by radiation alone, resulting in a 23.4 per cent three year cure rate. The primary therapy was surgical removal in 15 cases, sometimes with additional radiation, and in this group the three year cure rate was 26.6 per cent. In 84 cases followed five years by Perry, the cure rate was 11.9 per cent. Taylor and Nathanson[28] found 14.4 per cent of total cures in 822 cases, and Martin's group[12] reported 25 per cent of five year cures in 556 cases.

Robinson[29] observed that about 50 per cent of the patients in whom a diagnosis of carcinoma of the floor of the mouth was made early survived five years or more, and more than 50 per cent with carcinoma of the tongue without metastasis could be expected to survive for five years.

Treatment was recorded for 365 of our patients. Surgical procedures alone were used in 16 per cent, radiation alone in 38 per cent, and a combination of radiation with surgery, conservative, radical or both, was used in 42 per cent. Four per cent were given palliative treatment only.

The two year survival rates in relation to types of treatment indicated that 53 per cent of those patients treated by surgical methods alone (conservative, radical or both) could be expected to survive for at least two years; for those treated by both radiation and radical operation, 47 per cent; by radiation and conservative surgery, 40 per cent; and by radiation alone, 24 per cent (Fig. 3). It must, however, be taken into consideration that the last figure includes data on many patients who were in the terminal stage and to whom no other course of treatment was open. Had these patients been treated by surgery or a combination of surgery and radiation the outcome would no doubt have been the same. Reference to conservative or radical surgical procedures is based on the usually accepted definitions for these procedures.

METASTASIS OR EXTENSION OF TUMOR

Information as to metastasis or extension of the tumor or both was available on 332 of the 379 patients with follow-up data (Table 8). At last report 118 of these patients were living. Of these 35 had demonstrable metastases to lymph nodes or invasion of local areas, 27 had recurrences, and 56 were apparently free of disease. Two hundred and fourteen of these 332 patients were dead, and metastasis or extension or both had been recorded in all but 14. In 8 of the latter the tumor had recurred before death and

28. Taylor, G. W., and Nathanson, I. T. Lymph node metastases: incidence and surgical treatment in neoplastic diseases. New York, Oxford University Press, 1942.

29. Robinson, H. B. G. Diagnosis of cancer of the oral mucosa. Oral Med., Oral Surg. and Oral Path. 4:985 Aug. 1951.

in all but 6 recurrences, metastasis or extension (or both) was present.

The location of the metastases or extension of the tumor was recorded for 195 of the 200 patients who had died. Seventy-one per cent of these showed local extension and approximately the same number, lymph node involvement. Distant metastases were noted clinically in 22 per cent of these patients, but since autopsy was not performed in all cases, this figure may not represent a true incidence.

Local Areas of Involvement • Most of the 149 recorded local extensions were confined to adjacent intraoral areas. In 15 instances, however, the oropharynx was involved, in 8 cases the larynx, in 4 the epiglottis, and in 17 the muscles of the neck. The skin, the thyroid, the maxillary sinus, and the esophagus were involved in one case each. Within the oral cavity there were 12 instances of extension of the tumors into bone (10 to the mandible and 2 to the maxilla.)

Distant Metastasis • Ninety-one distant metastatic lesions were recorded. Of these, 40 per cent were in the lungs, 16 per cent in bone, 11 per cent in the liver, and 10 per cent in the kidney. The heart was the site of 8 per cent of the metastatic lesions. Other organs each accounting for 5 per cent or less of the total distribution were the adrenal glands, brain, diaphragm, spleen and gallbladder.

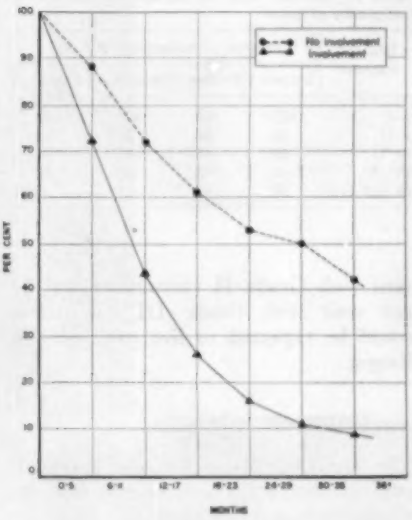

Fig. 4 • Survival rate of patients with intraoral squamous cell carcinoma in relation to lymph node involvement

SURVIVAL RATES

The survival rates used in this study were computed by the actuarial method (Berkson and Gage).[30] These rates were obtained by determining the probability of death within each six month period and on this basis computing the expected survival of 100 patients.

The survival rate for 372 patients with a known interval following hospitalization indicated that 34 per cent of the patients could be expected to live 2 years; 25 per cent, 3 years; 24 per cent, 4 years, and 21 per cent, 5 years.

The prognosis for patients with lymph node involvement was poor. From this group, 16 of 100 patients could be expected to live for 2 years or more and only 9 for 3 years or more. On the other hand, 53 of 100 patients without lymph node involvement could be expected to live 2 years, and 42, 3 years or more. (Fig. 4).

Two year survival rates were also computed in relation to the degree of malignancy of the tumor (Table 9). These showed that only 8 per cent of patients with Grade IV carcinomas could be expected to live two years or longer, whereas 54 per cent of those with Grade I carcinomas could be expected to live as long. The figures also indicated that 44 per

30. Berkson, J., and Gage, R. P. Calculation of survival rates for cancer. Proc. Staff. Meet., Mayo Clinic 25:270 May 24, 1950.

Table 9 • Survival rate of patients in relation to malignancy of tumor

Interval (Months)	Degree of malignancy of tumor			
	Broders I	Broders II	Broders III	Broders IV
0–5	100.	100.	100.	100.
6–11	86.	86.	74.	68.
12–17	80.	65.	47.	29.
18–23	60.	48.	33.	23.
24 and over	54.	44.	23.	8.

cent with Grade II carcinomas and 23 per cent with Grade III carcinomas could be expected to live two years or longer.

HISTOLOGIC DATA

The histologic features of the squamous cell carcinoma are well known and the characteristics recorded in this study are intended only to attempt to establish a relationship with the natural history of the tumor. Certain data observed were of questionable value because in many instances the tissue specimens were not representative of the tumors as described by contributors. For this reason, only the size of the lesion, the presence and density of inflammation, the pattern of growth, invasion of bone, muscle, or glandular tissue and the degree of malignancy, were analyzed.

Inflammation • Chronic inflammation was present in 396 lesions and both chronic and acute inflammation in two. In the remaining three no inflammation was noted in the material available.

Moderate or heavy concentrations of inflammatory elements were present in 76 per cent of the 398 lesions, minimal in only 23 per cent.

Pattern of Growth • In the majority of the cases (347) it appeared that masses of cells may have separated from the main body of the tumor to grow again and repeat this process. This, of course, must remain an impression since demonstration of such activity is not possible. A growth in which distinct fingerlike processes invaded adjacent tissue was noted in 38 of the tumors.

Areas of Invasion • Two hundred of the tumors showed definite invasion of muscle, with involvement of bones or glandular tissue or both in eight instances (Fig. 5-7).

Degree of Malignancy • Broders' grading of the degree of malignancy of squamous cell carcinoma has been widely accepted and is used by many investigators (Fig. 8-11). Perry and Cameron[20] graded 78 of 95 tumors and the greatest number were in Grades II and III. Morrow[31] found that 91 per cent of 92 cases of carcinoma of the tongue graded in his study were Grades I and II. On the other hand, Pfahler and Vastine[32] reported that 53 per cent of the tumors in their series were Grades III and IV. Berven[33] placed 47 per cent and 46 per cent of the lingual cancers in his study in Grade III and Grade IV, respectively. Judd and Phillips[34] cited Broders as having classified 50 per cent of the tumors in their study as Grades III and IV.

The tumors were classified according to their degree of malignancy by using Broders' criteria. The majority (84 per cent) were Grade II and Grade III. Ten per cent were Grade I, and only 6 per cent were Grade IV. Local extension was found in 24 per cent of the tumors classified as a Grade I and in 57 per cent of the tumors classified as Grade IV; metastasis to lymph nodes increased corre-

31. Morrow, A. S. Cancer of tongue. Report of 187 cases with an analysis of 98 treated principally by surgery at the New York Skin and Cancer Hospital between 1917 and 1935. Ann. Surg. 105:418 March 1937.

32. Pfahler, G. E., and Vastine, J. H. Irradiation therapy in cancer of the mouth; technic and results. Radiology 22:15 Jan. 1934.

33. Berven, E. G. E. Development of technic and results of treatment of tumors of the oral and nasal cavities. Am. J. Roentgenol. 28:332 Sept. 1932.

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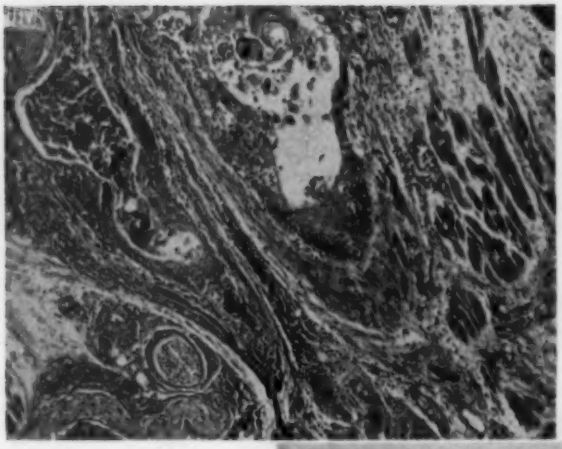


Fig. 5 • Carcinoma invading muscle tissue. Tumor at top center. Note fragmented muscle fibers

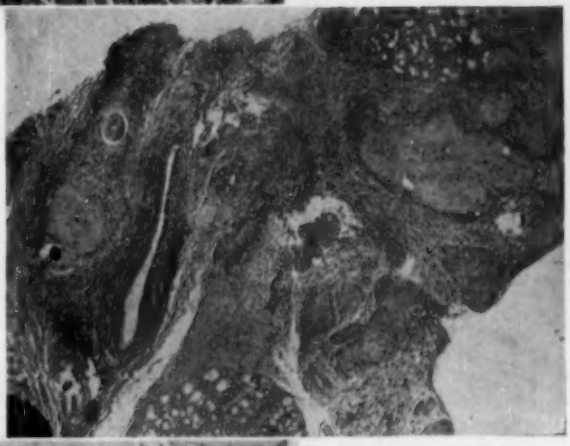


Fig. 6 • Carcinoma invading glandular tissue. Tumor at right; glands at left

Fig. 7 • Carcinoma invading bone of mandible

spondingly from 17 per cent to 57 per cent, and distant metastases from 5 to 26 per cent.

DISCUSSION

Although the incidence of intraoral squamous cell carcinoma in relation to carcinoma in all other areas of the body is somewhere between 5 and 15 per cent, and although it is found in a readily accessible area easily and frequently seen by the patient, physician and dentist, the five year survival rate is low (21 per cent in this study).

Several factors appear to enter into the determination of the patient's survival period. The three year survival rate for those patients with tongue lesions was lower than for those who had lesions in any other intraoral location. This in spite of the fact that 38 of the patients with carcinoma in the buccal mucosa had distant metastasis and only 19 of the patients with carcinoma in the tongue had distant metastasis.

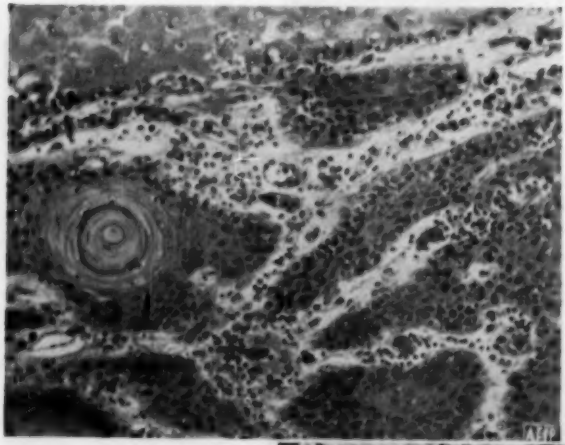


Fig. 8 • Carcinoma of tongue; Broders' Grade I

Fig. 9 • Carcinoma of tongue; Broders' Grade II

As expected, the survival rate for patients with Grade IV carcinomas is lower than that for those with Grades I, II or III tumors, also the survival rate is lower for patients with large lesions than with small lesions. However, no correlation exists between the two factors. In other words, in many instances a Grade IV carcinoma was a small lesion and a Grade I carcinoma a large lesion.

Syphilis is often mentioned as a causative factor and it does occur more often in patients with intraoral carcinoma (18 per cent) than in the general population (5 per cent). The patients with syphilis have a lower survival rate (17 per cent) than those without syphilis, which tends to suggest a correlation. The majority of intraoral carcinomas associated with syphilis, however, are located on the tongue, which may well account for the lower survival rate.

Two other important factors must be considered in this discussion and they both involve the time element. When the initial diagnosis of the tumor was correct

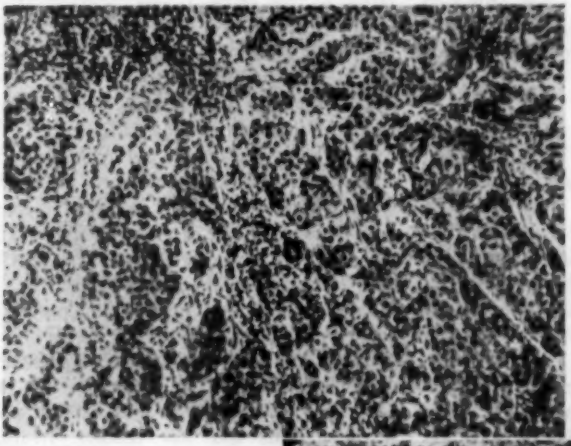
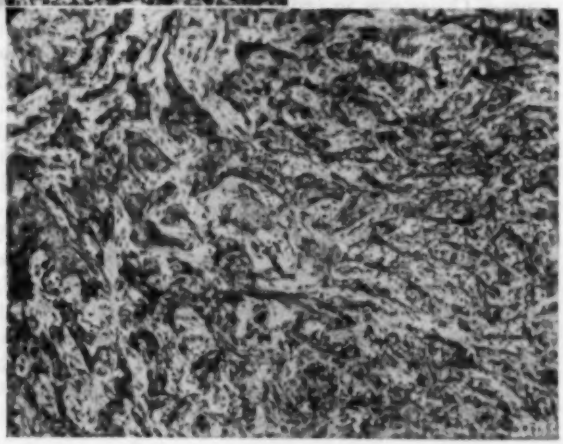


Fig. 10 • Carcinoma of tongue; Broders' Grade III

Fig. 11 • Carcinoma of tongue; Broders' Grade IV



at time of first visit, it was found that the patient had delayed seeking aid two months longer than when the initial diagnosis was incorrect. This is somewhat of a paradox as patients are constantly advised to seek aid from a dentist or a physician as soon as they have any unusual symptoms or a lesion that fails to heal. Further, the average time elapsing before treatment for cancer in the case of tumors initially misdiagnosed was almost five months, while those with an initial correct diagnosis were treated for cancer within one month. The difference in the total length of time in the two groups—that is, from onset of symptoms to the first treatment for cancer—was only two months, yet the two year survival rate for the patients initially incorrectly diagnosed was 24 per cent lower.

SUMMARY

Four hundred and one cases of intraoral squamous cell carcinoma were analyzed with respect to the clinical characteristics and microscopic findings. Particular emphasis was placed on the primary site of the lesion, degree of malignancy, survival rates and size of lesion.

1. The site of origin for over one half (52 per cent) of the carcinomas was the tongue. Other sites in order of descending frequency were the floor of the mouth, alveolar mucosa, palate and buccal mucosa.

2. Patients with carcinoma of the tongue represented a younger age group, had lymph node involvement or metastasis more frequently or extension or both, and a lower three year survival rate than patients with lesions in other intraoral locations.

3. The two year survival rate for patients with lesions of 1 cm. or less was 42 per cent as compared to the 28 per cent for patients with lesions of 3.6 through 8 cm.

4. Patients with intraoral squamous cell carcinoma who had serologic evidence of syphilis at the time of admission had a poorer chance for survival than those with no history of syphilis.

5. On the average the patients in the initially correct diagnosis group waited 4.2 months after onset of symptoms before seeking professional aid; this group received treatment for cancer within four weeks. In contrast, the patients whose lesions were initially diagnosed incorrectly sought treatment within 2.6 months; however, diagnosis and treatment for cancer were delayed for 4.7 months.

6. The survival rates computed in relation to type of treatment indicated that with surgery (conservative, radical or both) 53 patients out of 100 would be expected to live two years or more. This is considerably higher than the survival rates for those treated by radiation.

7. The survival rate for 372 patients with a known interval following hospitalization indicates that 34 per cent might be expected to live 2 years or more; 25 per cent, 3 years; 24 per cent, 4 years, and 21 per cent, 5 years or more.

8. Prognosis for survival of patients with lesions having lymph node involvement for the 2 year period was 16 patients out of 100; for the 3 year period 9 out of 100, as compared to 53 and 42 patients whose lesions did not involve lymph nodes.

9. Two year survival rates in relation to degree of malignancy indicate that only 8 out of 100 patients with tumors having Broders' Grade IV classification are expected to survive.

10. The initial diagnosis was incorrect for 38 of the 256 patients with intraoral carcinoma. These 38 showed 24 per cent fewer survivals than the 218 cases in which the initial diagnosis was correct.

11. On the basis of the findings here the use of tobacco cannot be indicated nor can it be ruled out as an etiologic factor.

Suggested improvements in the utilization of dental auxiliary personnel

Joseph C. Muhler, D.D.S., Ph.D., Bloomington, Ind.

The services of the auxiliary dental personnel have been integrated with the services of the dental profession in exactly the manner originally suggested in 1908 by Fones. The general practitioner thus has been relieved of a great number of the time-consuming duties which otherwise he would have to perform in order to provide the public with the wide range of services now endorsed by the American dental profession.

Hygienists serve the dentist by giving routine prophylactic periodontal treatments and by performing most of the roentgenographic work; the dental assistant aids the dentist at the chair and in the laboratory and the office. In the process of providing a much needed service to the profession, those engaged in this occupation have found a satisfying and fruitful manner in which to make a livelihood. It is possible, however, that the utilization of the auxiliary dental personnel has been too limited, that both the auxiliary personnel and their educators should expand the scope of their usefulness and provide additional and ever-increasing services for the dental profession.

It has been suggested that the hygienist could be taught to perform such work as casting inlays and polishing restorations. These duties, however, are those of the dental technician, not of the hygienist. Any changes in the educational and training program of the hygienist should be made to increase her usefulness in the preventive phase of dentistry, not in the restorative phase.

It may seem unrealistic to expect dentists, overwhelmed as the majority of them are today with a backlog of patients, to be willing to consider new demands on their services. If they realize, however, that no additional time will be required, that eventually these services will reduce the dentist's work and yet provide an increasingly better service for their patients, then the idea will be received with favor. It is the purpose of this paper, therefore, to present the advantages of using auxiliary dental personnel in the additional capacity of chemical laboratory technicians.

THE PROBLEM

The present ever-increasing rate of dental diseases is all the more alarming because it is occurring in spite of various ever-growing forces to combat it. The students graduating from dental colleges today have received the best education and technical training of any students in the history of American dental education. Descriptions of the beneficial effects of a myriad of prophylactic wonders have filled volumes of dental publications. The number of communities fluoridating their waters is steadily increasing. Never before has the nutrition of the mother-to-

Indiana University School of Dentistry, Indianapolis.

be and of the infant been so scientifically determined, and diets to insure it so generally put into practice. Yet all these factors combined have failed even to check the onslaught of dental diseases.[1]

Obviously the number of dentists cannot be increased sufficiently to meet the needs. It is true that there has been a slow, steady increase in the number of dental graduates over the past ten years, that new dental schools are now in the process of completion and some schools are graduating larger classes. That increase in number, however, is indeed small in proportion to the great need. Frequently it has been estimated that the number of dentists needed to provide the optimal dentist-to-patient ratio is many times the number practicing today.

THE SOLUTION

The only real solution to the problem of increase in dental caries and periodontal diseases is prevention, "prevention instead of affliction." It is in the preventive work of dentistry that the auxiliary dental personnel can serve in an important capacity, for they can provide many prophylactic and diagnostic services. The proper use of chemical tests, performed by the chemical laboratory technician, would materially decrease the occurrence and severity of dental diseases. Furthermore, the addition of these services to the work of the auxiliary dental personnel would increase the usefulness, the utilization and thus the attractiveness of the occupation to young people otherwise only moderately interested in training themselves for a career as auxiliary dental personnel. The dentist with such personnel would find his own usefulness to his patients greatly increased at the same time that the severity of dental diseases was being decreased.

In the practice of oral surgery, with sufficient training, the auxiliary personnel could make all necessary blood analyses, determining bleeding and clotting time, differential leukocyte count, red and white blood cell count, hemoglobin concentration, determination of serum calcium and phosphorus, phosphatase activity and any other tests of blood and urine that may be required or indicated by a competent oral surgeon.

Personnel of this type would be equally useful to a periodontist; they could perform a variety of analyses of blood, saliva and tissues which would aid the periodontist in establishing an accurate diagnosis of the patient's condition. Even more important, with such information, the periodontist himself would be in a position to understand each case more completely; and he would have a sound basis for treatment and follow-up instructions, instead of judging the case only from his impression of the morbid condition.

Periodontics offers a rich, unexplored field for biochemists or technicians interested in biology, since the condition of the oral tissues can be evaluated only through biological analyses of the tissues and their products.

The usefulness of auxiliary personnel would by no means be limited to periodontics and oral surgery. Pedodontics, roentgenology, prosthodontics, exodontics and general dentistry all are branches of dentistry where the services of such personnel could be utilized to the benefit of the personnel, the dentist and the patient.

In practice, the suggestion to the patient that he should avail himself of the services of the auxiliary personnel might be made as follows. For instance, if a young patient with rampant caries came into the office of a general practitioner, after the routine roentgenographic and oral examinations, the dentist would discuss the case with the parents. He would explain the limitation of the routine examination technics in the diagnosis and prognosis of caries, pointing out that in

1. Muhler, J. C.; Hine M. K., and Day, H. G. Preventive dentistry. St. Louis, C. V. Mosby Co., 1954, Chap. 1.

the great majority of cases restorative dentistry is not sufficient for the simple reason that unless some prophylactic management is instituted the restorations will not insure protection against future caries. He would then suggest one or more of the diagnostic tests for caries, perhaps saliva and blood analyses—for calcium, phosphorus and phosphatase concentration, saliva acidity and measurement of flow—and any other tests indicated.

A nutrition chart so designed that the type and quantity of food could be recorded for a prescribed period would be explained to the child and the parents. The auxiliary personnel could evaluate this chart, perform the necessary chemical tests and give the information to the dentist. Thus the practitioner would be far better equipped to combat future dental decay than the dentist who makes a mirror-and-explorer diagnosis and on that basis undertakes the restoration of the child's mouth.

The question arises immediately as to where the auxiliary personnel are to learn these procedures. This is an important consideration. An even more important consideration is the fact that few dentists are capable of utilizing the knowledge afforded by such diagnostic tests. For this reason the provision for such training would require the reorganization of the curriculum, at least to the extent that a separate course could be added to the curriculum or the subject could be made part of some other course.

An interesting possibility would be the adoption of a course specifically designed to teach both the dentist and the auxiliary personnel at the same time. This course would require possibly some 16 classroom hours. For the dental student, the material could be included in a broad course in preventive dentistry;[2] or a special, separate one hour course could be arranged. In the curriculum of the auxiliary dental personnel, either the subject could be taught as a separate course, or it could be integrated into the laboratory training in biochemistry.

There are a variety of diagnostic and prognostic tests available for the use of dentists today. The reasons they are not utilized are chiefly, first, that the dentist was not taught to use them when he was a student, and secondly, if the dentist becomes interested enough to wish to use them, he is too occupied with dental technical procedure to be able to use them correctly. Nevertheless, these are chemical tools which should be used to increase the dentist's ability to serve his patients.

The suggestion has been made that it would be advantageous for a university or perhaps a hospital to provide such laboratory facilities for the practicing dentist. Although this arrangement would provide an immediate solution, it would have the disadvantage of removing such services from the dental office, where they belong. The patient should be made to understand that the general practitioner himself is sufficiently interested and properly educated to provide these services.

Indeed, among the future specialties of dentistry, that of the "dental physician" —a title that has been suggested—might have an important place. The specialist in preventive and diagnostic dentistry would be responsible for the diagnosis and ultimate correction of dental caries, periodontal diseases, oral tumors and other less common abnormal conditions. The dentist in referring patients to this type of specialist would expect him to act as a consultant and to outline a treatment and follow-up plan. Though the specialist himself would perform no actual operative, prosthetic, periodontal or surgical treatment, he might at times be responsible for the follow-up treatment.

Many dentists have indicated a desire to specialize in dental roentgenology; but

2. Muhler, J. C.; Day, H. G., and Hine, M. K. The importance of a course in preventive dentistry in the dental school curriculum. J. D. Educ. 16:211 Nov. 1952.

in the past, few have attempted such a limited practice on the grounds that there is not sufficient demand for such a service. The services of the dental roentgenologist combined with those of the dental diagnostician would provide not only a satisfactory income for such a specialist but also a much needed dental service.

The ultimate success of the profession in curing dental caries and periodontal diseases will depend on the efficacy of the preventive treatment it provides. In that prevention the auxiliary dental personnel could have an important role.

Place of life insurance in the dentist's financial program

R. J. Dolwick, Cleveland

The dollar in the pocket of the dentist and the physician is the same kind of dollar as that in the pocket of the merchant, the manufacturer, the farmer and the man who works for a salary—it weighs the same, bears the same markings and has identical purchasing power. But the financial problems faced by either professional man are peculiar to members of the dental or the medical professions.

The income-producing value of the dentist or the physician does not exist apart from him; he cannot will it to his wife or children. His books, office equipment, practice and accounts are of little value when he can no longer use them. The thousands of dollars invested in his education and the years spent in acquiring his skill represent his capital investment, an investment that is made worthless by death, incapacity or old age.

In contrast to his situation, the man who owns a successful wholesale or retail business has his shelves stocked with merchandise worth thousands of dollars. He has men working for him who can "carry on" in his absence so that his capital will continue to produce income for him if he is disabled or for his family if he dies. If the family or the individual wishes to sell the business—at his death or on his retirement—the investment can usually be recovered at cost or with a profit, so that no loss is incurred. The very minute the professional man stops working, however, his "invested capital" stops producing income.

The basic value of life insurance has been and always will be the indemnification of the human asset. There is no way for a man to underwrite his future earnings or activity value other than through life insurance.

Presented before the Section on Practice Management, ninety-fourth annual session, American Dental Association, Cleveland, September 30, 1953.

General agent, The Northwestern Mutual Life Insurance Company, Milwaukee, Wis.

THE ESTATE CREATED BY LIFE INSURANCE

Life insurance is the only method by which a modest outlay can create instantly a substantial estate. Life insurance immediately bestows on a man's family the assurance of receiving the full face value of his policy in the event of his death. This provision is exceedingly important because for the investor the question is not "if he will die" but rather "when he will die."

With an ordinary life insurance policy, for example, a man aged 35 can set up at once an estate of $50,000 for only $1,382 a year, or approximately $115.00 a month. His family receives the $50,000 even if he dies one day after his plan is in force.

If a man took the same $1,382 and received 2 per cent interest—net after taxes—and died at the end of the first year, his family would receive only $1,410 instead of $50,000. If he died at the end of 5 years, his family would receive $7,335 instead of $50,000. If he died at the end of 10 years, his family would receive $15,435 instead of $50,000. After 20 years, $5,200 more of dividends which had accumulated during these years would be added to the $50,000, making a total of $55,200 for his family.

Few people are lucky enough to inherit an estate. The rest of us must rent one or ask our families to gamble with us while we save one. If a dentist or a physician is to receive a fair return for his investment, he must have a long span of life. If he dies in his early years of practice, his dependents suffer an enormous financial loss unless proper provision has been made for the continuation of their income.

Few professional people ever take the time to calculate their cash value—not what their bank account, bonds, car, home and so forth are worth, but what they themselves represent in actual "dollar value as an income-producing unit." Many professional men would not be willing to sell their future earnings to age 65 for the amount of life insurance they now own, but that's exactly the amount their families would receive in place of future earnings if they should die prematurely.

An apartment house, a store or any other form of investment yielding a net income of $10,000 is valued at $200,000 on a 5 per cent basis, and even at $100,000 on a 10 per cent basis. If having the home, dental equipment and car appraised and adequately insured is important, it is a thousand times more essential to have earning power protected. Only about one in two hundred homes ever burns, but every man dies or wears out before he dies.

The true value of any property is its ability to produce income. By using the "capitalization method of valuation," the following table can be set up for appraising the income value of a professional man:

Annual income	*Cash value*
$10,000	$100,000
15,000	150,000
25,000	250,000
50,000	500,000

These figures are based on the assumption of an exceedingly liberal yield of 10 per cent.

So far attention has been directed to the professional man who dies too soon; consideration must be given also to the man who lives beyond the period of his usefulness. The average man eats 15,768 meals after he has reached the age of 65. No manufacturer with a plant and machinery worth $50,000, $100,000 or $250,000 would think of running his business without a "depreciation reserve." If he did, some day he would find himself without funds to replace the machinery and buildings. He would be out of business: out of income. His accounting department would not allow him to operate

one month without setting aside part of each dollar of income for depreciation.

The manufacturer has fire insurance to safeguard his plant against destruction by fire, and he builds up his depreciation reserve to replace the inevitable loss by time and wear. In other words, he protects his assets first against premature destruction and second against loss of income-producing power through the "wearing-out" process.

Unless the professional man protects his assets against premature destruction and adopts the principle of setting up a regular annual depreciation reserve, he cannot hope to achieve a fundamentally sound financial status. Every hour that he works leaves one less hour to work in the future.

SELECTION OF PLAN

The far-sighted physician or dentist recognizes that he must set up a depreciation fund against the day when he is no longer able to work. He knows, too, that he must protect his family. When a man accepts these basic facts, there is only one question left: "What kind of plan shall he use?"

The plan he selects must meet at least three conditions:

1. It must supply an income sufficient to meet his and his family's future needs at an outlay he can afford today.
2. It must free him of worry and care. No man who wishes to achieve professional success can spend hours and days worrying about financial planning.
3. It must safeguard him against disability and his family against hardship if he dies too soon.

The one obvious answer to these requirements is life insurance; it guarantees money for future delivery either to the individual or to his family.

Often people buy life insurance at random. They buy mainly because of a vague feeling that they ought to have more insurance or because some policy is represented as a good buy. The other and far wiser way for the policyholder to select life insurance is to purchase it according to an over-all plan, carefully analyzing his needs, setting up a definite goal of security and working steadily toward it.

When a patient goes to his dentist every six months or so for a checkup, the dentist takes roentgenograms of his teeth, then works from the roentgenograms. A good life insurance underwriter likewise works by appointment just as the dentist does. His function is much like that of any analyst or diagnostician. He assembles all the facts, helps the client to visualize his objectives, puts each element to the test of experience and then works out a formula for obtaining the results desired. His diagnostic technic cannot be as exact as the dentist's but generally follows a well prescribed pattern. Most life insurance companies have excellent, well standardized methods of analyzing individual needs. Once the needs are analyzed, the underwriter and client are in the position to decide on the type of life insurance the client should buy.

Actually all policies are mathematically equal to each other. With the exception of term insurance, all policies provide savings if the dentist lives or payment on his death. For a given deposit a plan either provides large savings and a smaller amount of life insurance or a large amount of life insurance and small savings—the savings benefit is always balanced against the death benefit. The buyer must balance his need and his desire for immediate protection against his problem of retirement. The chart shows the differences and similarities in two typical plans.

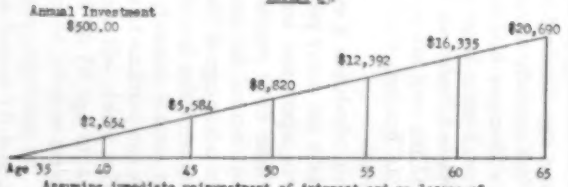
Most young professional men start out with some debts for equipment, education, or in some cases, an office building. Often the young professional man must be satisfied to start his life insurance program with only the protection part of the

B. L. - 65
MALE

Age 35

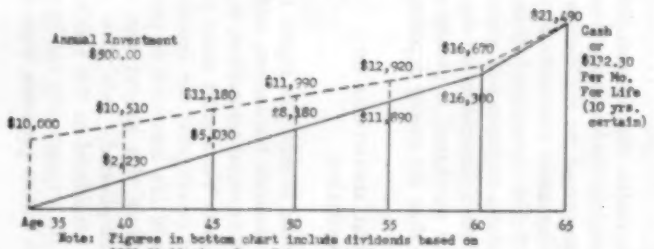
THE ANTICIPATION PLAN

Theory 2%



Assuming immediate reinvestment of interest and no losses of either principal or interest.

THE REALIZATION PLAN



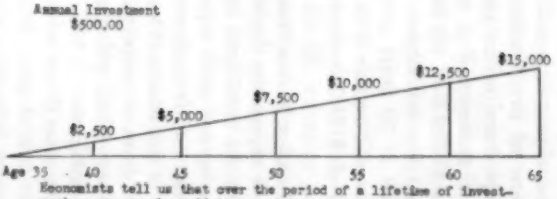
Note: Figures in bottom chart include dividends based on 1953 dividend scale. Not guaranteed.

It would be necessary to have $79,380 invested at 2% to obtain an interest income of $132.30 per month.

LIFE PAID-UP AT 65

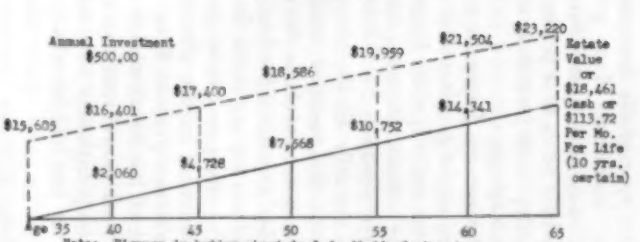
Age 35

ACTUAL RESULTS



Economists tell us that over the period of a lifetime of investment, a man may be said to have been a successful investor if he has preserved his principal.

THE REALIZATION PLAN



Note: Figures in bottom chart include dividends based on 1953 dividend scale. Not guaranteed.

It would be necessary to have $68,232 invested at 2% to obtain an interest income of $113.72 monthly.

program. This type of life insurance is called "term" insurance. Many professional men who buy term insurance change it in later years to a permanent plan which offers both protection and a retirement advantage.

Professional men are deeply concerned about the retirement problem, and consequently in the majority of life insurance purchases by physicians and dentists there is ample provision for the retirement factor. Actually all life insurance policies, except the so-called term insurance, have an annuity clause. No matter what kind of permanent life insurance is purchased from any one of the leading companies, the insurance can be used to provide a retirement income after it has served its protection purpose. Every permanent kind of life insurance has cash values which can be converted to a life income for the policyholder or to a joint life income for him and his wife.

COST

Few people realize that it costs little to have a substantial life insurance program. The interest earned on the savings part of the life insurance contract will cover the cost of the protection; thus, the money available at the end of a specified number of years, depending on the plan of insurance purchased, is usually equal to or more than the money deposited.

FINANCIAL ADVANTAGES OF LIFE INSURANCE

Nowadays the income tax aspect of almost every business transaction, and certainly every financial transaction, is carefully examined. Yet a great many people have never investigated the income tax advantages of life insurance as personal property. Since this subject can easily become complicated, only two main points are considered in this article.

First of all, arrangements can be made so that the entire proceeds from a life insurance policy, distributed at the death of the insured to his beneficiary in a series of installments whether for a limited period of time such as 20 years or for the lifetime of the beneficiary, are entirely exempt from income tax.

For example, if a successful dentist owns $100,000 of life insurance and arranges for installment payments for a period of 20 years after his death, his widow will receive $504 per month or a total of $121,000 absolutely income-tax free.

The same income "tax-free advantage" can be enjoyed by the insured while he is living. An intelligent life insurance underwriter can make it possible for anyone to plan his life insurance to take advantage of this benefit. There seems to be no other form of property that a man can purchase which will have as few income tax problems.

The second tax advantage of life insurance is of great interest to one who becomes successful and finds his tax bracket higher each year. If a married man earns $25,000 a year and takes the usual deductions, he is in a 42 per cent income tax bracket; he must consider this fact carefully when he makes investments that pay him immediate taxable income. Even a 4 per cent taxable yield shrinks to 2.3 per cent for the investor at the 42 per cent tax bracket. The higher the tax bracket, the lower will be the net yield.

This calculation is exceedingly simple; yet there are many people who overlook the tax aspect and are surprised to find that their thrift results merely in an increased income tax problem.

The advantage of life insurance is that the accumulation in a life insurance policy is not taxable annually. A man 35 years of age can purchase types of life insurance policies which will yield a net average return to age 65 of 2¼ per cent with complete security, no management problem, no publicity, scientific diversification, and no annual income tax on the

gain. The explanation is that the investment is compounded automatically.

Up to this point the family protection and the personal retirement aspects of a life insurance contract have been considered. The third element in a balanced financial program and one that is extremely important to the professional man is the provision for illness or accident.

In the event of prolonged illness or disabling accident, under the waiver of premium clause, the life insurance company pays the premium—the full face value of the contract remains in force. The life insurance investment continues to increase in value. The savings continue to grow just as though the premium were being paid by the policyholder.

Even if the policy is for term insurance, which has no cash value, and the policyholder becomes disabled, most insurance companies automatically will convert the policy to ordinary life insurance and pay the increased premium. The ordinary life insurance policy has a good cash value, which increases each year. The policy, with its increasing value, will belong to the policyholder although he may never pay another premium. This so-called waiver of premium or self-completing feature is invaluable, especially to the dentist or any other professional man.

OVER-ALL BENEFITS

Over-all benefits of owning life insurance are outstanding. The ownership of a policy gives the holder peace of mind, freedom from worry, which enables him to live a happier, more useful life, and a fuller release to his energies for the job of making a career. This freedom from anxiety permits a sharper focus on the elements that make for real success.

The individual who sets up his life insurance program early is headed on the straightest and best road to economic security for himself and his family. His sense of security, stability and confidence make him a better producer. In providing for the future, he is likely to be a better provider for the present.

As Charles E. Wilson, Secretary of Defense and former president of General Motors, said recently, "Success for the individual comes down to three very personal things—it is accomplishment—it is freedom and it is satisfaction." If this statement is true, the man who has an adequate life insurance program has achieved genuine success.

It would be hard, perhaps impossible, to find a man who, nearing the end of life and looking back, felt that he owned too much life insurance; but there are many who earnestly wish that they owned much more.

Character • It is well for the world that in most of us, by the age of thirty, the character has set like plaster, and will never soften again. *William James, Psychology.*

COUNCIL ON DENTAL HEALTH

Dentist representation on state and local boards of health

Consultation of the health professions is vital to the proper function of all government health programs. At the state level, the professional advice usually is provided to health departments through formally organized bodies known as boards of health, health committees or councils. As long ago as 1938, the American Dental Association took action to emphasize the importance of dental representation in such bodies.[1]

The need for wide representation has been stressed also by the American Public Health Association. A statement[2] adopted recently by that association specified not only that "Every state health department should have a board of health serving as an advisory and quasi-legislative body," but that "The membership . . . should be adequately representative of the medical and other professional groups and the public." It was emphasized further that

> No single profession or business group should constitute a majority. The board, consisting of from seven to nine members, should be appointed by the governor for staggered terms of office of from five to seven years. The appointments should take into consideration the expressed interest and experience in the general field of health. . . .

To determine the current status of dental membership on state boards of health, the Council on Dental Health conducted a survey that was completed in July of this year. Replies were received from 48 states, the District of Columbia and three U. S. territories. The status of dentist representation on both state and local advisory health boards, as reported in the survey, is shown in the table.

It was found that 46 states have boards of health or health committees that serve as advisory or policy-forming bodies to their health departments. Dentists are serving on such boards or committees in 35 states. In 25 of these states, the dentist membership is required by law. A similar, but more extensive, study in 1945[3] showed that at that time the total number of states in which dentists were serving on such advisory boards was 24, with dentist representation being required by law in 21 of the states.

The 1954 study showed further that 11 states also stipulated the membership of a dentist on local advisory health boards. In an additional five states, dentists were serving at the local level although their service was not legally required. One state, Mississippi, reported that it had discontinued local health advisory boards years ago.

Hawaii was the only territory reporting the requirement of a dentist member on its health advisory board; it does not have local boards. Alaska replied

1. American Dental Association. Transactions, 1937, p. 298.

2. The state health department—services and responsibilities. An official statement of the American Public Health Association, adopted November 11, 1953. A. J. Pub. Health 44:235 Feb. 1954.

3. Gruebbel, A. O. Dental services and dental personnel in state health departments. J.A.D.A. 32:1281 Oct. 1945.

Table • Dentist membership of policy-forming or advisory body of state and local health departments

State	State boards			Local boards	
	Number of dentist members required by law	Total number of board members required by law	Dentist(s) reported as serving but not required by law	State law specifies inclusion of dentist(s)	Dentist(s) reported as serving but not required by state law
Alabama	0	10			
Arizona	0	5			
Arkansas	1	8			
California	1	9			
Colorado	0	9	x		
Connecticut	0	6			x
Delaware	1	8			
Florida	1	5		x	
Georgia	2	14			x
Idaho	No board				
Illinois	0	9		x	
Indiana	1	9			
Iowa	0	11			
Kansas	1	10			
Kentucky	0	•			
Louisiana	1	9			
Maine	0	15			
Maryland	1	8			
Massachusetts	0	7	x		x
Michigan	0	5	x		
Minnesota	0	9	x	x	
Mississippi	1	10		No local boards	
Missouri	No board				
Montana	1	7		x	
Nebraska	1	7		x	
Nevada	1	5			
New Hampshire	0	7	x		
New Jersey	0	7			
New Mexico	0	5			
New York	0	8			
North Carolina	0	9	x	x	
North Dakota	1	9		x	
Ohio	0	7	x		
Oklahoma	0	9	x		
Oregon	1	9		x	
Pennsylvania	1	10			
Rhode Island	0	5			
South Carolina	1	12			
South Dakota	1	9			
Tennessee	1	9		x	
Texas	1	9			x
Utah	1	•		x	
Vermont	1	•			
Virginia	1	7			
Washington	0	5	x		
West Virginia	1	•			x
Wisconsin	0	7	x	x	
Wyoming	1	6			
Totals—States	25		10	11	5
District of Columbia	0	0	x		
Alaska	0	5			
Hawaii	1	11		No local boards	
Puerto Rico	No board				

•Not reported.

that it neither requires nor has dental representation on its territorial board. Puerto Rico reported that an advisory health board is not provided for by law.

Neither Idaho nor Missouri has a state advisory board. In Idaho, the medical policy for the health department is recommended by the medical advisory committee of the state medical association. The policies of the Dental Health Section are recommended by a Public Health Committee comprising ten dentists appointed by the president of the Idaho State Dental Association. Neither committee is provided for by state law.

When Missouri's present state constitution was adopted in 1945, provision for a state board of health, an appointive body, was discarded, leaving the division of health without an official advisory group.

During the past nine years, dental representation on governmental health advisory boards has increased 20 per cent through legal requirement; nearly 50 per cent through practice. This impressive increase parallels other indications of the importance the public is attaching to dental health, notably in the fields of prevention, education and treatment: the introduction of fluoridation programs in more than 1,000 communities in the United States; the expansion of school and community dental health education programs, and the doubling in 20 years of the number of persons who visit their dentists. Although the trend is gratifying, a challenge still exists for the profession in those states where the value of dental representation on health advisory boards has not been recognized officially.

COUNCIL ON DENTAL RESEARCH

List of Certified Dental Materials: a revision

On recertification by the manufacturers of the silicate cements on the List of Certified Dental Materials, samples were tested recently by the American Dental Association Research Fellowship at the National Bureau of Standards under the supervision of that Bureau. These materials were found to comply with revised American Dental Association Specification No. 9 for Silicate Cements (effective July 1950). This list supersedes that published in the December 1953 issue.

CERTIFIED SILICATE CEMENTS
(A.D.A. SPECIFICATION NO. 9)

Cement	*Manufacturer or distributor*
Ames Plastic Porcelain	The W. V-B Ames Co.
Astralit	Premier Dental Products Co.
Baker Plastic Porcelain	Baker & Co., Inc.
Certified Synthetic Enamel	Lee Smith Company
DeTrey's Synthetic Porcelain	The L. D. Caulk Co.
Durodent Enamel	Oskar Schaefer
Syntrex	The L. D. Caulk Co.
S. S. White Filling Porcelain Improved	The S. S. White Dental Mfg. Co.

COUNCIL ON JOURNALISM

Standards for constituent dental society publications

Among the first tasks undertaken by the Council on Journalism after its establishment in 1948 was that of evaluating the publications of the Association's constituent societies and ascertaining the opinions of dental editors regarding their own responsibilities and the purposes of their publications. The generous response received from the constituent society editors provided the Council with a fairly accurate perspective of the objectives of dental journalism as those objectives were reflected in the minds of the profession's editors. From this study and other sources, the Council prepared the following Standards for Constituent Dental Society Publications which were approved by the House of Delegates at the ninety-third annual session of the Association. It is the hope of the Council on Journalism that these standards will be considered by all dental editors as fundamental and as a guide to better dental journalism.

Objectives • Every constituent dental society should own and control its own publication.

The objective of the dental publication is to elevate the profession by keeping the members of the society informed of the scientific, social and economic developments which affect the health and welfare of the public.

It is recommended that these objectives be carried out by the following means:

1. Publishing research and practical articles, case reports, abstracts of current literature, book reviews, editorials, news of dentistry, reports of the society's official actions and a roster of officers.

2. Providing for exchange of ideas and opinions by members.

3. Establishing minimum standards for the acceptance of advertising.

4. Publishing an attractive journal in keeping with high professional ideals and representative of the dignity, the strength and the vision of its sponsor.

Support • Ideally and practically a constituent society journal should depend solely upon the society for financial support although additional revenue may be obtained from other ethical sources.

The Council concurs in the statement of the American Association of Dental Editors that "dental societies may secure funds for the publication of an official journal from three sources . . . (1) from members through a subscription fee, (2) from the sale of advertising space to worthy commercial firms and (3) through additional subsidy from the dental society . . . members."

Administration • The Council concurs in the statement of the American Association of Dental Editors that:

> The principal responsibilities of the owner of the publication are to determine policies and procedures so that the venture will prove worth while as a means of fulfilling professional needs and so that it can be conducted within the financial structure of the organization. Likewise, the owner must see that the publication is operated successfully.

The owner also must designate the broad fields in which the influence of the periodical will be exercised, determine the scope of the journal and outline its general policies regarding editorial and scientific content, advertising and finances.

The constituent dental society as owner of the publication is responsible for the selection of the editor and business manager either by appointment or election and they in turn should be held responsible for the selection of their assistants.

A committee may be appointed by the governing body of the constituent dental society to act in an advisory capacity to the editor. This committee (which should be of the rotating type) will adequately reflect the changing policies of successive administrations.

Good editors are hard to locate and are most valuable to an organization after some years in office. The Council urges each new constituent administration to avoid changing editors whose abilities and potentialities are satisfactory.

Technics of Publication • Preparing a modern constituent dental society journal for publication is no longer a one-man job to be undertaken by a practicing dentist during his spare time or after office hours. The editor must have competent assistance, the amount of which will depend on the size, contents and standards of the publication. Assistant or department editors may be obtained on a volunteer basis, but manuscript editors and secretaries should be remunerated. The editor should organize his staff for the purpose of obtaining and editing material in ample time to meet his publication dates and he should set up and adhere strictly to a publication schedule in order to expedite the processing of his journal.

The Council recommends that when possible editors employ a typographical expert to assist them in establishing a pleasing, practical format for their journal. The assistance of such an expert, which can be obtained at nominal cost, will aid materially in improving the format of many constituent society publications.

The selection of a competent printer is essential to the successful publication of a dental journal. The following factors should be considered in making the selection:

1. The printer must be a competent artisan.

2. He must be a good business man with a sound financial rating.

3. He must have the personnel and mechanical equipment necessary to meet the publisher's rigid requirements.

4. He must be prepared at all times to give prompt and reliable service. This point is of particular importance when an out-of-town printer is being considered. The difficulties of processing a publication by mail should be weighed carefully against any saving in cost promised by an out-of-town printer.

COUNCIL ON DENTAL THERAPEUTICS

Council announces classification of additional products

The classification of products by the Council on Dental Therapeutics has been described in a previous report (J.A.D.A. 40:489 April 1950). The Council's program now provides for classification of products in Group A, Group B, Group C and Group D. Products are reconsidered periodically, and decisions are subject to change at any time that a substantial amount of new evidence becomes available. The files of the Council contain information on many drugs and dental cosmetics, and inquiries are welcome.

GROUP A

Listing of products in Group A means that at the time of their consideration, the items conformed with the provisions for acceptance established by the Council on Dental Therapeutics and adopted by the Board of Trustees and the House of Delegates of the American Dental Association. Items in this group will be listed in *Accepted Dental Remedies* and may use the Seal of Acceptance, unless otherwise provided.

The following additional products are classified in Group A:

Benzalkonium Chloride, U.S.P. (See A.D.R. ed. 19, p. 85)

Benzium Concentrate (Continental Chemical Company): Benzalkonium chloride, 6.4 per cent; water, 93.6 per cent. This is a concentrated dosage form, intended for dilution with distilled water to produce a 1:1000 solution of benzalkonium chloride.

Benzium Solution: Benzalkonium chloride, 0.1 per cent; sodium nitrite, 0.2 per cent, and water.

Benzathine Penicillin G (See report on page 714)

Permapen (Chas. Pfizer & Company, Inc.): A brand of benzathine penicillin G.

Permapen in Aqueous Suspension, 600,000 Units per Cartridge: Each cc. is stated to contain benzathine penicillin G, 600,000 units in a stabilized aqueous suspension with methylparaben, 0.12 per cent and propylparaben, 0.01 per cent. In Steraject disposable cartridges.

Bicillin (Wyeth Laboratories): A brand of benzathine penicillin G.

Bicillin Tablets, 100,000 Units, 200,000 Units: Stated to contain benzathine penicillin G and excipients.

Bicillin Oral Suspension, 300,000 Units per 5 cc.: Each 5 cc. is stated to contain benzathine penicillin G, 300,000 units, sodium benzoate, suspending agents, color and flavor. In bottles, 2 fluid ounces.

Bicillin in Aqueous Suspension, 600,000 Units per cc.: Each cc. of aqueous suspension is stated to contain benzathine penicillin G, 600,000 units, with suspending and dispersing agents. In 1 cc. cartridge vial (Tubex) with sterile needle.

Bicillin in Aqueous Suspension, 300,000 Units per cc.: Each cc. of aqueous suspension is stated to contain benzathine penicillin G, 300,000 units, with suspending and dispersing agents. In 10 cc. vials.

Bicillin, 1,200,000 Units per cc., for Aqueous Injection: Addition of 1 cc. water for injection provides a single dose of 2 cc., each cc. of which contains ben-

zathine penicillin G, 600,000 units, procaine penicillin G, 300,000 units, potassium penicillin G, 300,000 units, and sodium citrate.

GROUP B

Listing of products in Group B means that there is insufficient evidence to justify their present acceptance, but there is reasonable evidence of their usefulness and safety. These products meet the other qualifications and standards established by the Council on Dental Therapeutics. It is the Council's opinion that Group B products may be promoted for special use and study.

The Council's initial consideration of products which may be eligible for Group B listing is influenced favorably by the knowledge of further investigations then in progress. It is the policy of the Council to reconsider Group B products each year on the basis of new evidence which may be produced in their support. Classification in this category is not ordinarily continued for more than three years.

GROUP C

Listing of products in Group C means that the evidence is so limited or inconclusive that the products cannot be accurately evaluated. It is the Council's opinion that Group C products require further study by qualified investigators.

GROUP D

Listing of products in Group D means that they are unacceptable because of their demonstrated inability to meet the standards outlined in the provisions for acceptance.

Report on benzathine penicillin G

The Council on Dental Therapeutics has classified several forms of two brands of benzathine penicillin G (Bicillin-Wyeth and Permapen-Pfizer) in Group A (see page 713).

Benzathine penicillin G is the dipenicillin salt of dibenzylethylenediamine. Because of the low water solubility of the compound (approximately 0.2 mg., equivalent to 200 units per milliliter, at 37°C.), the material, when injected, provides effective blood levels of penicillin for unusually long periods of time. A single parenteral dose of 1,250,000 units, for example, is reported to provide detectable serum levels of penicillin in all patients studied at the end of three weeks, and in 75 per cent at the end of four weeks.[1] In another study, all serum samples showed penicillin when assayed at 5 to 39 days after injection of 1,200,000 units as a prophylactic dose every four weeks.[2] Weekly doses of 300,000 units administered intramuscularly maintained effective serum levels of penicillin throughout the course of treatment for 16 weeks. Intramuscular administration of 600,000 units every two weeks was equally effective.[1]

Since it is seldom necessary to maintain penicillin blood levels for long periods in dentistry, benzathine penicillin G will probably be used infrequently by dentists for therapy by the intramuscular route. This product may be useful to dentists as a prophylactic agent in connection with extractions performed in

1. Stollerman, G. H., and Rusoff, J. H. Prophylaxis against Group A streptococcal infections in rheumatic fever patients; use of new repository penicillin preparation. J.A.M.A. 150:157: Dec. 20, 1952.

2. Putnam, L. E., and Roberts, E. F. Prolonged blood concentrations of penicillin following intramuscular benzathine penicillin G. Antibiotics & Chemotherapy (in press).

patients with a history of rheumatic heart disease or in the treatment of oral infections in individuals when it is advisable to administer only a single dose of penicillin. Its parenteral use in dentistry has been reported.[3] Available evidence indicates that the incidence, severity, and duration of penicillin reactions have been no greater following injection of benzathine penicillin G than reported with more soluble penicillin compounds.[4,5] Because it is such a long lasting preparation, however, it would appear important to avoid its intramuscular use in a patient who is sensitized to penicillin.

By injection, benzathine penicillin G alone provides a repository type of dose. A mixture of readily soluble potassium penicillin, moderately soluble procaine penicillin and the slowly soluble benzathine penicillin G is available. With a single injection of this combination, adequate blood levels are achieved rapidly and are sustained for relatively long periods of time.

Some disagreement exists concerning the absorption of benzathine penicillin G by oral administration. In one study, oral doses of 300,000 units produced adequate serum levels of penicillin in 101 children and 17 adults.[6] A single oral dose of 600,000 units, administered to five adult patients, produced a serum level of 0.5 unit per milliliter at some time after administration, and penicillin activity was demonstrated in all patients at six hours and in all except one patient at nine hours.[7] Penicillinemia was demonstrated in 31 out of 58 adults at the eighth hour and in 50 per cent at the tenth hour after ingestion of a single 200,000 unit tablet.[8] In a series of 6 subjects, however, other workers failed to demonstrate that serum levels of penicillin were significantly more prolonged after administration of 300,000 unit doses of benzathine penicillin G than after equivalent oral doses of potassium penicillin G or procaine penicillin G.[9]

Benzathine penicillin G is stable in aqueous suspension, is tasteless and appears to be absorbed readily from the gastrointestinal tract without relation to meals.[10] The use of added acid buffers is not required for oral administration. The oral dosage forms may be used for prophylaxis in postextraction bacteremias when employed to supplement parenteral medication.

The toxicity of benzathine penicillin G is of the same order as the toxicity of procaine penicillin, with which it has been compared.[11] Benzathine penicillin G is not more irritating than procaine penicillin to ocular mucosa, skin and muscle.

Oral administration of 200,000 to 300,000 units of benzathine penicillin G every 6 to 8 hours will produce adequate blood levels for the treatment of most penicillin-sensitive infections, and in severe cases will maintain adequate blood levels after the initial parenteral administration of a more soluble penicillin preparation.

3. Nathanson, I. G.; Morin, G. E., and Mallett, S. P. Dibenzylethylenediamine dipenicillin G (Bicillin) in dental use: clinical observations in 150 patients. Antibiotics & Chemotherapy 3:368 April 1953.

4. Stollerman, G. H.; Rusoff, J. H., and Hirschfeld, I. Prophylaxis against Group A streptococci in rheumatic fever patients by the use of single monthly injections of N, N' dibenzylethylenediamine dipenicillin G (Bicillin). Antibiotics Annual 1953-54, p. 114.

5. Smith, C. A., and others. Treatment of early infectious syphilis with N, N'-dibenzylethylenediamine dipenicillin G. Am. J. Syph., Gonor. and Ven. Dis. 38:136 March 1954.

6. Cathie, I. A. B., and MacFarlane, J. C. W. Oral N, N'-dibenzylethylenediamine penicillin in children. Brit. M. J. 1:804 April 11, 1953.

7. Lepper, M. H., and others. Use of dibenzylethylenediamine penicillin administered orally in bacterial infections. Antibiotics & Chemotherapy 2:175 April 1952.

8. Welch, H.; Randall, W. A., and Hendricks, F. D. Serum concentrations of penicillin following administration of various preparations of dibenzylethylenediamine dipenicillin G (DBED penicillin). Antibiotics & Chemotherapy 3:1053 October 1953.

9. Foltz, E. L., and Schimmel, N. H. Comparison of orally administered penicillins. I. N, N'-dibenzylethylenediamine dipenicillin G. II. Procaine penicillin G. III. Potassium penicillin G. Antibiotics & Chemotherapy 3:593 June 1953.

10. Coriell, L. L., and others. Scarlet fever and mixed infections of the throat and naso-pharynx treated orally with dibenzylethylenediamine dipenicillin G. Antibiotics & Chemotherapy 3:357 April 1953.

11. Seifter, J., and others. Toxicity of N, N'-dibenzylethylenediamine and DBED penicillin. Antibiotics & Chemotherapy 1:479 November 1951.

BUREAU OF LIBRARY AND INDEXING SERVICE

The American Dental Association Film Library

The Film Library has compiled information on dental films, filmstrips and slides that are suitable for television use by dental societies and other professional groups. This listing can be found on pages 25 and 26 of the Film Library's booklet, *Audio-Visual Materials in Dentistry,* which is available on request. The Film Library, in cooperation with the Bureau of Public Information, will act as a central clearing house for the exchange of dental society television programs to assist dental societies with information on formats for television programs which use audio-visual materials in dentistry.

The film, "Starting Dental Care Early," described in this article was produced for television by the Cleveland Health Council in cooperation with the Cleveland Dental Society as one of its series on health education. Since it is only 20 seconds long, it has been appearing regularly on three Cleveland television channels as a public service announcement.

The film, "The Legislative Process," has been added to the Film Library collection to assist the legislative committees of dental societies with their programs.

FILMS RECEIVED

Starting Dental Care Early • 16 mm., black and white, sound, 20 seconds. Produced especially for television by the Cleveland Health Council in cooperation with the Cleveland Dental Society. Procurable on loan ($.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago. Purchase ($10) from the Cleveland Health Council, 1001 Huron Rd., Cleveland.

This film has no title since it is to be used as a spot announcement in combination with regular television programs. A mother is showing her two year old daughter how to brush her teeth, and at the same time the narrator tells why starting dental care early is important. (Suitable for health education television programs.)

Airbrasive Technique • 16 mm., color, sound, 1,675 feet, 43 min. Produced in 1949 by the S. S. White Dental Manufacturing Company, 211 S. 12 St., Philadelphia. Procurable on loan ($2.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago, and on loan or purchase from the producer.

This film describes the function of the Airdent unit and compares the cutting done by this instrument with that done by rotary instruments. (For general practitioners and other interested professional groups.)

The Legislative Process • 16 mm., color, sound, 1,029 feet, 28 min. Produced in 1954 by the Indiana University Audio-Visual Center. Procurable on loan ($2.50) from the American Dental Association Film Library, 222 E. Superior St., Chicago, and on loan ($8 for color print, $5 for black and white) from the Indiana University Audio-Visual Center, Bloomington, Ind. It may be purchased ($250 for color and $135 for black and white) from the producer.

The General Assembly of Indiana is used as an example of a state legislature in action, and the various steps through which bills must pass to become laws are illustrated. Synchronous sound sequences show the action taken on bills in both the House and Senate chambers as well as in committees. (Suitable as a general information film for use by legislative committees for dental society programs.)

DECEMBER 1954

LON W. MORREY, D.D.S., EDITOR

VOLUME 49 • NUMBER 6

Published by the American Dental Association
222 East Superior Street • Chicago 11, Illinois

THE Journal OF THE AMERICAN DENTAL ASSOCIATION

Editorials

A program of dental health for the World Health Organization

A week-long meeting in Geneva last September of seven members of the health professions—international consultants to the Director General of the World Health Organization—marked another milestone in the progress of dentistry. Although so faintly publicized as to cause scarcely a ripple on the sea of international health problems it, nevertheless, will go down in history as of prime importance. It was the first conference of its kind ever to be held; it was an indication of the recognition given to dental health problems by WHO officials, and the recommendations of the seven conferees will form the foundation for future action by the World Health Organization in matters of dental health.

The consultants grouped their recommendations for a realistic international dental health program into four major categories—education, prevention, treatment and research. Proposals for the fulfillment of the objectives in these categories included the collection of basic information regarding the prevalence of dental disease; the organization and administration of a dental program; the training and use of a technical staff; the development and application of health education materials and the fostering and extension of dental research. The consultants further recommended that the World Health Organization, within the limits of its budget facilities, apply these proposals toward the prevention, control and treatment of the five major dental disorders: dental caries, periodontal diseases, irregularities of the teeth and jaws, cleft lip and cleft palate and oral cancer.

Significant for a world dental health movement is the international character of the group chosen to outline the program.

The seven men who labored for the better part of seven days drawing up the recom-

mendations for the guidance of the World Health Organization in matters of dental health are: Saiful Anwar, M.D., director, Public Health Service, East Java, Surabaya, Indonesia; H. Berggren, director, Eastman Institute, Stockholm; Philip E. Blackerby, Jr., director, Division of Dentistry, W. K. Kellogg Foundation, Battle Creek, Mich.; J. W. Knutson, chief dental officer, U. S. Public Health Service, Washington, D.C., (chairman); G. H. Leatherman, secretary-general, Fédération Dentaire Internationale, London; C. F. Mummery, chief dental officer, Malayan Medical Service, Kuala Lumpur, Selangor, Malaya (rapporteur), and J. Stork, honorary treasurer, Fédération Dentaire Internationale, Aerdenhout, Netherlands.

The basic principles proposed at the September Geneva dental conference and the measures recommended for their fulfillment fit well within the pattern and purposes of the World Health Organization. WHO defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." The attainment of the highest level of health, as has been pointed out so many times by so many people, can be achieved only when proper attention is given to the improvement of dental health.

Some advice on giving advice on nutrition

A report of the Council on Dental Therapeutics of the Association on certain aspects of nutrition to be included in the 1955 edition of *Accepted Dental Remedies* might well become a permanent part of every dentist's library as it cautions members, by implication, against becoming involved with those pseudoscientists whose nutritional ministrations consist largely of a mixture of old wives' tales and empiricism.

Ever since man first became conscious of the relation between food and his physical being, countless crimes have been committed in the name of nutrition. The ancient hunter ate the heart of his adversary in the belief that it would give him strength and courage. Some still live who consider that fish is good food for the brain. Hippocrates taught that a man who ate raw food suffered severely in his bowels and did not live long, but the man who ate bread and boiled meat and who drank wine was well nourished. Early American nutritionists, ignorant of vitamins and knowing little of minerals, condemned foods which today are highly prized. As late as 1911 one government expert condemned the use of fresh fruit and vegetables although a growing number of scientists of the time were collecting evidence to demonstrate the nutritive value of such foods. During the past half century this world has literally eaten its way through a period of Fletcherism; a period of minerals, particularly calcium and phosphorus, and into a period of vitamins in which it still wallows.

What the field of nutrition holds in store for man in the future, only the future can tell. But it is hoped for the well being of the generation of tomorrow, that the empiricism of the food faddist soon will give way entirely to the research of the scientist.

Every nutritionist knows that good nutrition depends on many things other than the intake of an adequate diet. "The field of modern nutrition," states McCollum,[1] "covers more than qualitative aspects. In addition, it is concerned with the deter-

mination of the requirements for all nutrients and factors which affect their utilization." Many of those factors remain unknown, yet the commercial food faddist ignores these blanks in nutritional knowledge and by means of radio, television, newspaper and magazine would have listeners believe that the product which he promotes is the true elixir of life. Because many vendors of vitamins are particularly obnoxious in this respect and because some members of the dental profession, unfortunately, are unduly influenced by their claims, certain precautions of the Council on Dental Therapeutics[2] are in order.

"Many exaggerated and uncritical claims for vitamin products have been made to the profession and to the public. Numerous irrational and expensive mixtures of vitamins and minerals have been developed. The Council on Dental Therapeutics does not accept certain complex products containing vitamins A and D together with water soluble vitamins, nor certain other dosage forms because of their lack of demonstrated usefulness in the practice of dentistry. . . . Lesions of the oral mucosa related to the prolonged inadequate supply of the water soluble vitamins may occur in the absence of other recognized manifestations. When suggestive oral lesions are present it is desirable for the dentist to seek the cooperation of the physician since the possible malnutrition may also involve conditions requiring medical treatment."

Unless the dentist keeps himself well informed on the latest aspects of nutrition, he would be wise to speak sparingly on the subject lest he unwittingly align himself with that endless group who blithely continue to err in the interest of nutrition.

It also behooves the dental schools to insist that their graduates are not only well grounded in the latest scientific knowledge of nutrition but also imbued with a healthy skepticism regarding claims and theories relating to those facts of the field where research has not yet yielded substantial results.

1. McCollum, E. V.; Orent-Keiles, Elsa, and Day, H. G. The newer knowledge of nutrition, ed. 5. New York, Macmillan Co., 1940, p. 29.

2. Council on Dental Therapeutics. Accepted Dental Remedies 1955. Chicago, American Dental Association. In press.

The ninety-fifth annual session: praise for Miami

The ninety-fifth annual session of the Association, held last month in Miami, is now history and the twelve thousand members and guests who participated will long remember its program, its environment and the hospitality of its hosts. For those who were so unfortunate as to have missed the meeting, the news section of this issue carries a condensed yet comprehensive account of the scientific presentations and the actions of the House of Delegates.

The Association has grown so large and the requirements of its annual session have grown so great that few cities have the facilities to meet the organization's convention needs. Miami, fortunately, has recently moved into the acceptable circle. In fact, the southern city's hotel and exposition resources, plus the resourcefulness of the local arrangements committee, proved so satisfactory this year that the Association has accepted an invitation to return there for its ninety-eighth annual session in 1957. Certainly it is the consensus of the delegates, essayists, clinicians, exhibitors and all other participants in the 1954 session that the warmth of Miami's sunshine is only exceeded by the warmth of her hospitality. The Association looks forward to 1957 when its members can again bask in both.

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3 C. A. Haggerd
First Vice-President

4 F. W. Herbine
Second Vice-President

5 J. E. Fauber
Third Vice-President

6 H. B. Washburn
Treasurer

7 Harry Lyons
Speaker

Bernard C. Kingsbury of San Francisco, president-elect of the Association, comes to his post from the position of Trustee from the Thirteenth District. A general practitioner, Dr. Kingsbury has held many offices in dental organizations. In 1949 he served as general chairman of the Association's annual session in San Francisco and became first vice-president in 1950. He has been a member of the House of Delegates continuously since 1939. He is a past president of the San Francisco Dental Society and the California State Dental Association. Dr. Kingsbury was graduated from the College of Physicians and Surgeons, A School of Dentistry. He has served the school as trustee and treasurer since 1923. In addition, he has served on its faculty as professor of prosthetic dentistry since 1920.

Daniel F. Lynch, oral surgeon of Washington, D. C., was inducted as president of the Dental Association at the general meeting of the annual session, November 9, 1954. Dr. Lynch has served the Association as Trustee from the Fourth District, as chairman of the international relations committee and a member of the Special Committee on Problems in the Field of Oral Surgery. In 1936, 1947 and 1952 he represented the Association at the International Dental Congresses of the Fédération Dentaire Internationale and served as an F.D.I. vice-president from 1947 to 1953. Consultant and lecturer at the Army Medical Center in Washington, D. C. and at the Naval Dental School in Bethesda, Md., Dr. Lynch serves as consultant also to the U. S. Air Force, the Veterans Administration and the U. S. Public Health Service.

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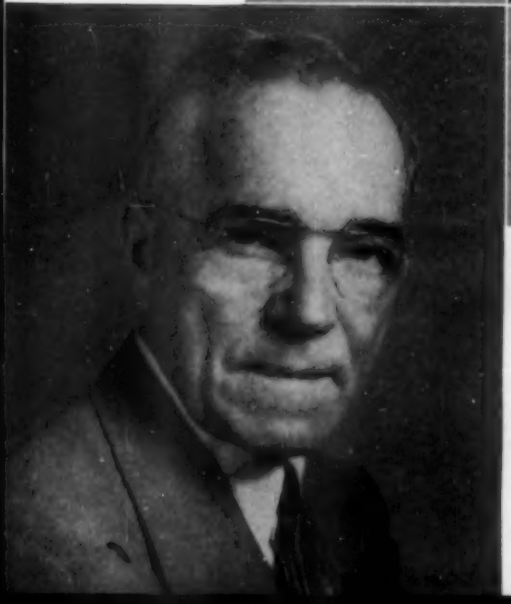

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Curtis A. Haggard of Miami, Fla., first vice-president, has been in the general practice of dentistry since his graduation from the University of Louisville School of Dentistry in 1941. Chairman of the Local Arrangements Committee for the Association's 95th annual session, Dr. Haggard has been active also in Florida dental societies. He has served in various capacities including those of secretary, vice-president and president of the East Coast District Dental Society; program chairman for the state society; chairman of the state society's dental schools committee and member of its illegal practice committee.

Frederick W. Herbine, of Reading, Pa., elected second vice-president, is the outgoing chairman of the Council on Dental Trade and Laboratory Relations, a council on which he held membership for six years. Dr. Herbine has been president of the Pennsylvania State Dental Association and has served the state group in other capacities as well.

John E. Fauber, third vice-president, is the medical director for dentistry of the Veterans Administration. Dr. Fauber joined the VA after a tour of duty with the Army. He is a graduate of the University of Pennsylvania dental school and holds a Master's degree in public health from Johns Hopkins University. Dr. Fauber was elected to the House of Delegates for the first time in 1937 and has been returned to the House almost continuously in the last four years.

H. B. Washburn of St. Paul has held the post of Association treasurer since 1948. Previous to serving as president of the Association in 1947-48, he served as a Trustee for two terms. Active in local dental affairs also, he has been president of the St. Paul District Dental Society and the Minnesota State Dental Association.

Harry Lyons of Richmond, Va., Speaker of the House of Delegates, is dean of the Medical College of Virginia School of Dentistry. He was a member of the Council on Dental Therapeutics for 17 years and has served also as chairman of the nomenclature committee and committee on national emergency dental service. In 1953 he was appointed to a four year term as a member of the National Advisory Dental Research Council. The Council advises the Surgeon General on the use of federal funds administered by the National Institute of Dental Research for research grants to nonfederal institutions.

John R. Abel was chosen for the post of Trustee from the Thirteenth District. Dr. Abel has been chairman of the Association's subcommittee on civil defense. An orthodontist from Beverly Hills, Calif., he is a graduate of the University of Southern California Dental College, is a faculty member of the School's graduate division of orthodontics, and is a past president of both the Los Angeles Dental Society and the Southern California Dental Association.

William R. Alstadt, elected to a second term as Trustee from the Twelfth District, began the practice of orthodontics in Little Rock, Ark., in 1939. A civilian consultant in orthodontics at the Army-Navy Hospital in Hot Springs, Ark., he is also the dental member on the Civil Defense Board of Arkansas. He has served the Association on its Council on Legislation and has been a member of the House of Delegates for some time. In addition, Dr. Alstadt has held office in his state and district dental societies and has served on the Arkansas State Board of Dental Examiners.

Charles H. Patton, orthodontist of Philadelphia and past president of the Pennsylvania State Dental Association, has been elected Trustee from the Third District. After the death of W. Earle Craig in October of last year, Dr. Patton was appointed to fill Dr. Craig's place. Dr. Patton will serve for the remainder of the unexpired term which ends in 1956. A graduate of the University of Pennsylvania, he has been a member of the Council on Scientific Session and has held the presidency of a number of professional organizations, including the Academy of Stomatology, Pennsylvania Association of Dental Surgeons and the Middle Atlantic Society of Orthodontists.

Percy T. Phillips, of New York, Trustee from the Second District, was appointed in 1953 to represent the Association at meetings of the Inter-Association Committee on Health and at meetings of the National Health Council. He has served the Association in various capacities including service on the Council on Constitution and Bylaws. He has the distinction of being the first person elected Speaker of the House of Delegates, being chosen for that post when it was created in 1950. Dr. Phillips is a graduate of the College of Dental and Oral Surgery of New York. This will be his second term as Trustee.

C. S. Renouard, who will represent the Eleventh District, is a general practitioner from Butte, Mont. Dr. Renouard has been active in affairs of dentistry for many years. He has served as secretary-treasurer of the Montana State Dental Association. He is a former member of the Advisory Committee to the Association's Bureau of Economic Research and Statistics and frequently has been a member of the House of Delegates. This is Dr. Renouard's second term as Trustee.

John R. Abel
Trustee, Thirteenth District

William R. Alstadt
Trustee, Twelfth District

Charles H. Patton
Trustee, Third District

Percy T. Phillips
Trustee, Second District

C. S. Renouard
Trustee, Eleventh District

ANNUAL SESSION OPPOSES EXTENSION OF SPECIAL DRAFT, REJECTS O.A.S.I., ELECTS OFFICERS, CHOOSES CENTENNIAL SITE

Approximately 12,000 dentists and guests from all parts of the United States and from other countries attended the 95th annual session in Miami, Fla., November 8-11. The 403 members of the House of Delegates, in considering the nation's dental health problems, set policies of the Association for the coming year. The scientific program, consisting of symposiums, essays, table clinics, projected clinics, motion pictures, scientific exhibits and technical exhibits presented the latest information available on all aspects of dentistry. A dental health conference, a conference of state society officers and meetings of more than 20 associated dental groups preceded the annual session. Greetings were received from President Eisenhower, Mayor Wagner of New York and many other high officials.

The House of Delegates again went on record against Old Age and Survivors Insurance for dentists, opposed further extension of the physician-dentist draft act, approved the extension of Children's Dental Health Day to Children's Dental Health Week, voted for the publishing by the Association of a dental abstract journal and authorized a Bylaws change to permit the establishment of a scientific section on anesthesiology.

New York City, the metropolis of the state in which the Association had its birth in 1859, was chosen as the site for the 1959 centennial celebration. Miami was selected for the 1957 meeting and Dallas, Texas, for 1958. The House had already approved San Francisco for the 1955 annual session and Atlantic City for 1956.

Francis J. Herz of San Francisco was appointed General Chairman of the Committee on Local Arrangements for the 1955 meeting to replace William B. Ryder, Jr., who for personal reasons had resigned. Earlier, the Board of Trustees appointed Eugene R. Westcott chairman of the Committee of Local Arrangements for the 1956 Atlantic City meeting.

ELECTION OF OFFICERS

Daniel F. Lynch, of Washington, D.C., became president of the Association at the close of the annual session November 11, succeeding Leslie M. FitzGerald of Dubuque, Iowa. Elected by acclamation for the post of president-elect was Bernerd C. Kingsbury, Sr., of San Francisco. Other officers, all elected unanimously, are Curtis A. Haggard, first vice-president; Frederick W. Herbine of Reading, Pa., second vice-president; and John E. Fauber, assistant chief, medical director for dentistry, Veterans Administration, third vice-president. The House rose in tribute after electing Harry Lyons of Richmond, Va., to his fourth term as Speaker of the House.

John R. Abel of Beverly Hills, Calif., was elected Trustee of the Thirteenth District to succeed Dr. Kingsbury, the new president-elect. Other trustees, all re-elected unanimously for three year terms, are: Percy T. Phillips of New York, Trustee for the Second District; Charles H. Patton of Philadelphia, Trustee for the Third District; C. S. Renouard of Butte, Mont., Trustee for the Eleventh District; William R. Alstadt of Little Rock, Ark., Trustee for the Twelfth District. H. B. Washburn of St. Paul was re-appointed treasurer by the Board of Trustees.

HONORARY AND ASSOCIATE MEMBERS

The top honor of the Association, honorary membership, was conferred on Thomas J. Hill of Cleveland and William T. Sweeney, of Washington, D.C. The awards, given for "outstanding contributions . . . made to the dental profession," were unanimously approved by the House of Delegates and were presented by Leslie M. FitzGerald, president of the Association.

Dr. Hill, professor of clinical oral pathology and therapeutics at the School of Dentistry, Western Reserve University, and retiring chairman of the Association Council on Dental Therapeutics, a post he has held since 1947, has had a distinguished career in the research field. He is a past president of the International Association for Dental Research and the author of some 50 scientific reports.

Mr. Sweeney, a pioneer in the development of precision casting technics and in the use of acrylic resins in dentistry, has been chief of the dental research section at the Bureau of Standards since May 1954.

Associate memberships were conferred on Shailer A. Peterson, Ph.D., and Reginald H. Sullens, B.M.E., secretary and assistant secretary respectively of the Association Council on Dental Education.

Also awarded associate memberships were Carl W. Fairhurst, Milwaukee; John Walter Stanford, B.S., Alexandria, Va., and Shu-Yung Wang, M.D., Chicago.

In another action, the House elected to life membership 478 dentists from 43 constituent societies and the federal dental services.

RESOLUTIONS OF THE HOUSE

Actions of major importance to the profession and the public were taken by the House of Delegates, which during its four meetings, considered more than 60 resolutions submitted by state societies, Association councils and the Board of Trustees.

PHYSICIAN-DENTIST DRAFT

Unless "international tensions require a material increase in military personnel," the dental profession is opposed to extension of any special draft law for dentists, the House of Delegates stated in its meeting November 10. In opposing an extension of the dentist-physician draft law, presently scheduled to die June 30, 1955, the delegates approved a report which pointed out that an adequate dental care program for military personnel could be maintained from the ranks of dental school graduates with basic Selective Service liability.

RETIREMENT FUNDS

The Association will continue its efforts for enactment of legislation such as was embodied in the Reed-Keogh bills, the House decided. Under these bills, dentists would have an opportunity to establish a retirement income plan for themselves and would receive tax exemption on the income set aside for retirement in the same way as is now allowed for beneficiaries of company-sponsored plans. The House rejected a resolution of the Colorado State Dental Association calling on the Association to develop a retirement insurance program of its own.

O.A.S.I.

After lengthy discussion spread over two days, the House again went on record against coverage for dentists under the Old Age and Survivors Insurance provisions of the federal Social Security Act.

A motion to put the Association on record for the compulsory inclusion of dentists in the program was defeated by a vote of 235 to 152 on the voting machine, and a resolution favoring voluntary coverage was defeated 180 to 153 in a standing vote of the House.

FEDERAL DENTAL SERVICES

Military Dependent Care • The House approved a statement of policy on dental care for dependents of military personnel which stated that "during periods of extensive military mobilization . . . military dental officers should not be used to provide dental care to military dependents except . . . to provide for the immediate critical needs of dependents in strict emergency situations (and) to provide essential dental care to dependents in overseas installations and in remote areas within continental United States where civilian dental facilities are not available."

In taking this action, the House pointed out that the prime duty of military dental officers should be the care of military personnel and that the added duty of caring for dependents by dental officers could adversely affect both the dental care received by military personnel and that available for the civilian population. The House urged also that the government, should it decide to provide care for military dependents, estimate accurately the cost of such a program and appropriate sufficient funds for its proper functioning.

VA Dental Program • The House also reaffirmed its position favoring limitation of outpatient dental care by the Veterans Administration. It stated its support of H.R. 9866, introduced by Congressman Peter Frelinghuysen of New Jersey during the 83rd Congress. H.R. 9866 would have written into law the restrictions on outpatient dental care presently in effect through administrative regulations of the VA. These regulations require that veterans file application for treatment within one year after date of discharge and limit treatment to a single series for a proved service-connected disability. A resolution commending Rep. Frelinghuysen was unanimously approved.

Civil Defense • Continuation of the Subcommittee on Civil Defense was authorized until the 1955 annual session.

Special Pay for Dental Officers • Congress was urged by the House to continue the $100 special monthly pay of the Career Compensation Act as a permanent part of the compensation to be paid to all dental officers on duty in the Armed Forces and the U.S. Public Health Service.

ABSTRACT JOURNAL

The publication of a monthly abstract journal by the Association was approved. The Board of Trustees reported that there are about 1,200 articles of dental interest published each year in the English language and about 500 more in other languages. There is no journal which now makes these articles available to the profession. Therefore, a monthly abstract journal, the Board stated, "could provide a real service to members and to dentists and research workers throughout the world." Plans call for the launching of the new abstract journal January 1, 1956.

DENTAL FACILITIES UNDER HILL-BURTON ACT

The House of Delegates called on constituent and component dental societies to initiate action in cooperation with state and community groups to see that provisions are made for dental facilities in hospitals and nursing homes constructed as a result of the Hill-Burton Hospital Construction Act passed by the

83rd Congress. The law, as passed by the Congress, authorizes a three year federal-state program to build chronic disease hospitals, nursing homes, rehabilitation facilities and medical and dental diagnostic and treatment centers.

HOSPITAL DENTAL SERVICES

The House directed the Council on Hospital Dental Service to prepare for general distribution a statement clarifying the position of hospital dental services under the current standards and interpretations of the Joint Commission on the Accreditation of Hospitals. In addition, the Council on Hospital Dental Service is to submit to the 1955 annual session proposed amendments to the existing standards of the Joint Commission which the Council believes are needed to provide "acceptable administrative procedures for all phases of hospital dental practice, particularly those relating to physical examinations and administration of dental services including oral surgery."

Negotiations with Joint Commission • An explicit statement of standards pertaining to dental services in the place of "interpretations" of existing standards will be sought by the Council in future negotiations with the Joint Commission. The House directed the Council to draw up model bylaws which could be used by interested persons and agencies in the development of acceptable hospital dental programs and instructed the Council to bring to the 1955 annual session a recommendation on the desirability of requesting dental representation on the Joint Commission.

To aid in the Association's program to clarify the rights and responsibilities of hospital dental staffs, the House passed a resolution recommending that a hospital service rendering any phase of dental care be designated as a "dental department" or "dental service" and that the recognized specialties of dentistry "be administered first within the framework of the 'dental department' or 'dental service' and, secondly, under the prevailing pattern of hospital organization at the local level."

Special Committee on Oral Surgery • The House decided against continuing the Special Committee on Problems in the Field of Oral Surgery, and authorized the Board of Trustees to carry on whatever negotiations with the American Medical Association might be needed to resolve problems in the field of oral surgery.

WORLD HEALTH ORGANIZATION

Pointing out the desirability of having "some type of dental program established in the structure of the World Health Organization" and recognizing that the limited budget of WHO may be the cause for not establishing such a program, the House went on record favoring the lifting of the present ceiling on the United States assessment for the WHO. The views of the House on this matter will be presented to the appropriate government officials.

PUBLIC HEALTH

Dental Care in Chronic Illness • The House adopted a resolution submitted by the Council on Dental Health urging that constituent and component dental societies be encouraged to provide the necessary leadership in helping states and local communities to develop plans for dental care of persons chronically ill.

Union Programs • Also adopted was a resolution calling on dental societies to conduct informational programs for their members on labor unions' proposals for dental care programs. The resolution urged that guiding principles be developed so that such programs will be soundly conceived. In presenting the

resolution to the House, the Reference Committee on Public Health said, "One of the most important questions facing dentistry at this time is the increasing interest of labor unions concerning dental health care programs for their members and their families." The Committee suggested that those societies dealing with labor unions keep the Association informed of their activities so that "information may be accumulated to assist other component and constituent societies in answering questions that may come up regarding such a program in their respective societies."

Funds for Dentistry • The constituent societies were called on also to strengthen the dental health programs in their states. Funds earmarked for dental health purposes should be sought from the state and the appointment of a dental director to assure a sound administrative position for the dental program should be sought also, the House stated.

REORGANIZATION OF TRUSTEE DISTRICTS

The Special Committee on Reorganization of Trustee Districts was commended for its extensive study by the House of Delegates and the Committee was authorized to continue its efforts for an additional year in order to present recommendations for specific action to the House of Delegates in 1955.

In addition, the Committee was directed to study the feasibility of reducing the size of the House and to report the results of its studies at the 1955 annual session.

DENTAL TRADE AND LABORATORY RELATIONS

Two resolutions affecting dentistry's relations with the laboratory and trade groups were adopted by the delegates. The first, a long range program for maintaining effective relations with the trade and laboratories, was hailed as "a step forward" by the House. The second, *Principles for Guidance of Constituent Societies in Formulating and Administering Programs for Accrediting or Approving Dental Laboratories,* replaces the former *Program for Accreditation of Dental Laboratories.*

In addition, the House approved a Board action appropriating $5,000 for a study of the activities of mail order denture firms to determine whether in their advertising and display practices they have violated provisions of the federal law.

DENTAL EDUCATION

The Council on Dental Education was requested to call on the dental schools to augment the teaching of anesthesiology at all levels of the school curriculum in another resolution passed by the House.

Revision to permit more flexibility in dental school programs was made in the *Requirements for the Approval of a Dental School,* and the rules governing membership on the Council on Dental Education and the Council of the National Board of Dental Examiners were altered.

Under the latter resolution, nominees to the Councils proposed by the American Association of Dental Examiners must be active members of state dental examining boards at the time of their nomination and election and may not be members of a dental school faculty. However, should these representatives cease to be members of examining boards during the Council terms they may complete the balance of their terms.

Council members representing the American Association of Dental Schools who cease to be faculty members of a school belonging to the school group during their Council term shall no longer be eligible to serve, and the President shall declare their positions vacant.

STUDENT MEMBERSHIP

Constituent societies were requested by the House to review their policies on first year dues for student member graduates. A Council on Membership report pointed out that waiver of dues for the remaining months of the year of graduation and a reduction in dues for the first calendar year in practice are inducements prompting student member graduates to apply for active membership as soon as they receive their licenses.

COUNCIL MEMBERS

The House elected the following Council members:

Constitution and Bylaws:
James Berney, Iowa, 1957
Herbert L. Taub, New York, 1957

Dental Education:
Philip Blackerby, Michigan, representing the American Dental Association, 1957.
C. A. Frech, Indiana, representing the American Association of Dental Examiners, 1957
G. D. Timmons, Pennsylvania, representing the American Association of Dental Schools, 1957

Dental Health:
Byron W. Bailey, New Hampshire, 1957
Glenn R. Brooks, Michigan, 1957
J. H. Eshleman, Pennsylvania, 1957

Dental Research:
Thomas J. Hill, Ohio, 1957
Clemens V. Rault, District of Columbia, 1957

Dental Therapeutics:
Lester W. Burket, Pennsylvania, 1957
William B. Ingersoll, District of Columbia, 1957
Edward F. Mimmack, New York, 1957

Dental Trade and Laboratory Relations:
Herbert L. Bunker, Kansas, 1957
Fred Hunt, North Carolina, 1957

Federal Dental Services:
William H. Christensen, Washington, 1957
F. J. Reichmann, Oklahoma, 1957

Hospital Dental Service:
Harold H. Hookway, Massachusetts, 1957
Frank B. Hower, Kentucky, 1957

Insurance:
John W. Douglass, South Carolina, 1957
Francis J. Herz, California, 1957

International Relations:
Obed H. Moen, Wisconsin, 1957
Oren A. Oliver, Tennessee, 1957

Journalism:
Leon Abbey, New York, 1957
Vincent Lawlor, Pennsylvania, 1956
Morris J. Wilson, Kentucky, 1957

Judicial:
Willard C. Fleming, California, 1957
Maxwell Heckler, New York, 1957

Legislation:
Joseph Glaser, New York, 1957
Floyd W. Pillars, Iowa, 1957

Membership:
Edward Luebke, Illinois, 1957
John R. Wallace, Massachusetts, 1957

National Board of Dental Examiners:
John W. Green, Illinois, representing the American Dental Association, 1957
Robert I. Humphrey, Illinois, representing the American Association of Dental Examiners, 1957
H. Henry Weisengreen, California, representing the American Association of Dental Schools, 1957

Registry of Dental and Oral Pathology:
Harold Soloman, New York, 1957
Kurt H. Thoma, Massachusetts, 1957

Relief:
Malcolm R. Chipman, Washington, 1957
William O. Vopata, Illinois, 1957

Scientific Session:
David J. Fitzgibbon, District of Columbia, 1957
Charles S. Kurz, Illinois, 1957

CONSTITUTION AND BYLAWS

Changes in the Constitution and Bylaws authorized by the House include the following:

The privilege of election to life membership shall be available only to a member in good standing at the time of application for life membership. A candidate for life membership must be 65 years old and must maintain membership in good standing in his constituent and component societies in order to continue his life membership in the Association.

The duties of the President are enlarged to include the responsibility for arrangement of the program for the general meeting of the annual session.

The Board of Trustees rather than the House of Delegates shall select cities for annual sessions of the Association.

1955 BUDGET

The budget for the fiscal year 1955 provides for expenditures of $1,949,025, a spending level approximately the same as that of 1954. Estimated income is $2,004,500 and will come from membership dues, advertising and subscription receipts, earnings on investments, exhibit space rentals, fee payments to the Division of Educational Measurements of the Council on Dental Education and to the National Board of Dental Examiners. The excess of anticipated income over expense is $115,475.

GROUP HEALTH AND ACCIDENT INSURANCE

The qualification of the Group Health and Accident Insurance Program on a national basis was reported to the House. National qualification makes possible the issuance of insurance to members who would otherwise have difficulty in securing coverage owing to their impaired health. States which qualified on a state basis during the enrollment program were Alabama, Arizona, Arkansas, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Mississippi, Montana, New Hampshire, New Mexico, North Carolina, North Dakota, Puerto Rico, Rhode Island, South Carolina, South Dakota, Vermont, Virginia, West Virginia and Wyoming. Five states had had National Casualty Company plans in operation prior to the Association's insurance drive. They were California, Nevada, New Jersey, New York and Utah.

OTHER ACTIONS

The duties of the Council on Dental Health were redefined and provision was made for the establishment of a Bureau of Dental Health Education "to develop and maintain a program of dental health education for this Association and to assist the constituent societies and other agencies in the development of effective programs of dental health education."

The Council on Dental Health was requested to develop a dental health education program suitable for use by such youth groups as the Boy Scouts, Girl Scouts and 4-H clubs.

The governor of Puerto Rico, the Honorable Luis Munoz Marin, and Jaime Benitez, chancellor of the University of Puerto Rico, were commended for their work in promoting the interests of dentistry in Puerto Rico.

The House extended its appreciation to E. Harold Gale, retiring chairman of the Council on Legislation, for his work during the five years of his chairmanship.

In another resolution, the delegates directed the Council on Dental Research to investigate the possibility of a research fellowship in oral pathology at the Armed Forces Institute of Pathology, Washington, D.C.

The House approved the completion of an agreement by the Board of Trustees with the American Council on Education for the conduct of a comprehensive survey of dentistry.

PRESIDENT'S REPORT

The need for improved health care for the nation and the importance of dentistry's taking the lead in achieving that health care were major points in the report to the House of retiring President Leslie M. FitzGerald. Dr. FitzGerald stated his belief that the professional man has a responsibility in assuming active leadership in civic, religious and political activities and said to the delegates, "I believe that it is necessary for you, as representatives of your constituent societies, to return home and stress the importance of having more of our members take an active part in civic and political life in their communities." In this way, progress in health matters would be assured and the confidence of the public in the dental profession would be increased.

Dr. FitzGerald pointed out the continued existence of economic problems associated with the distribution of health care. He called attention to the dental care plans proposed by labor unions and other groups and urged that these plans be given careful study. In addition, prepayment and postpayment plans have been developed to help meet the economic problems faced by persons needing dental care. Dr. FitzGerald warned against governmental intrusion into the professional aspects of health care and asserted, "The best safeguard . . . is to make the needed progress under our own initiative."

In concluding his report, Dr. FitzGerald stated, "The common goal of the dental profession is to work for the betterment of health care for all of the people and to oppose any plans which, directly or indirectly, will injure that profession or the way of life in the country which has made it great."

SCIENTIFIC SESSIONS

Newer devices for cutting tooth structure, the effects of sugar and other carbohydrates on the teeth, hazards in roentgenology, improvements in elastic impression materials and the latest developments in endodontic procedures for the general practitioner were the subjects of the five panel discussions featured on the scientific program at the Dinner Key Auditorium. In addition, a symposium was presented on the dentist's responsibility in atomic bomb disaster.

The new experimental high speed devices for cutting tooth structure described in a panel moderated by Rex Ingraham, chairman of the operative dentistry department at the School of Dentistry, University of Southern California, included items such as ultrasonic devices, water-powered turbine-driven handpieces, diamond cutting instruments and air abrasive units.

Directors of two separate studies of the ultrasonic handpiece, which vibrates 30,000 times a second, gave progress reports on the device. Commander Arne G. Nielsen, of the U. S. Naval Dental School at Bethesda, Md., reported that there was need for much further study before the instrument could be used in dental practice. "The lack of sufficient data on the biologic effects of the cutting method demands the deferment of any clinical application," he said.

In commenting on the effect of the device on tooth enamel and on dentin, Commander Nielsen stated that the results "were inconclusive and characterized by erratic unpredictable instrument performance."

In a second report on the ultrasonic device, Carl R. Oman of the School of Dental and Oral Surgery, Columbia University, said that the device had been tried with "favorable results" on 40 persons but emphasized that the handpiece was still in an experimental stage.

Other types of high speed drills are being developed by the dental research staff at the National Bureau of Standards, by the staff at the University of Michigan and by workers at the School of Dentistry, University of Texas.

Panel participants in addition to Dr. Oman and Commander Nielsen were Floyd A. Peyton, of the School of Dentistry, University of Michigan; Donald C. Hudson and Jack L. Hartley of the U. S. Air Force Dental Service, guest workers at the National Bureau of Standards and Robert B. Black, guest lecturer at the School of Dentistry, University of Texas.

Other Panels • The basic phenomenology of nuclear explosions, the training of dentists in specialized treatment and anesthesia for mass casualties were topics discussed in the symposium on the responsibilities of dentists in atomic bomb disasters. Moderating the symposium was James R. Cameron, professor of oral surgery at Temple University School of Dentistry.

Technics in manipulation of elastic impression materials were illustrated by slides in the panel moderated by Maynard K. Hine, dean of the School of Dentistry, Indiana University.

Hazards of Dental Radiography, a film produced at the National Bureau of Standards in cooperation with the American Dental Association, was shown as part of the panel on hazards in roentgenology, moderated by Lee Roy Main, dean of St. Louis University School of Dentistry.

Moderating the discussion on the effects of sugar and other carbohydrates on the teeth was Harold J. Noyes, dean of The Dental School, University of Oregon. A panel discussion on endodontic procedures was moderated by Floyd D. Ostrander, professor of dentistry at the University of Michigan School of Dentistry.

In addition to the panel discussions, the scientific program featured table clinics, essays, motion pictures and projected clinics. The projected clinics, using large screens and slide projectors to illustrate the talks, were an innovation for the Association's scientific program.

SCIENTIFIC EXHIBIT AWARDS

Outstanding scientific exhibits in three categories were given awards by the Council on Scientific Session. The exhibits were grouped according to whether they had been prepared by an individual, federal agency or an association, institution, state or local government agency. The prize-winning exhibits were:

Individuals • a formula for predicting the extent of dental caries from roentgenograms, J. C. Almy Harding of San Diego, first; studies of dental abrasion, Alvin Edward Strock of Boston, second; exodontic and oral surgery procedures demonstrated by wax and soap models, Adolph L. Biel, Charleston, W. Va., third.

Federal Agencies • *Technical:* research and training program of the Army Dental Corps, first; resin cements, cooperative project at the National Bureau of Standards sponsored by the American Dental Association, Air Force, Army, Navy and Veterans Administration, second; prosthetic restorations in head and

neck surgery, Veterans Administration Dental Service, third. *General Information:* comprehensive dental care, research at the National Institute of Dental Research, fluorides in drinking water, U. S. Public Health Service, first.

Associations and Other Organizations • Technical: dental progress at the University of Alabama School of Dentistry, first; the maxillofacial team in treatment of deformities of the face, congenital and acquired, Northwestern University Dental School, second; team management of cleft palate and cleft lip conditions, University of Kansas School of Dentistry and University of Kansas School of Medicine, Arthur F. Lindquist of Kansas City, Mo., David W. Robinson, M.D., Kansas City, Kan., third. *General Information:* dentistry for the cerebral palsied, United Cerebral Palsy Associations, Inc., Dental Guidance Council for Cerebral Palsy, first; Saint Apollonia, the patron saint of dentistry, American Academy of the History of Dentistry, second.

GENERAL MEETING AND OTHER EVENTS

Senator William F. Knowland, Republican of California, called for a united free world in his address before the general meeting of the annual session November 9. The Senator said Soviet aggression justifies breaking off diplomatic relations with Russia.

There are over 800 million people behind the Iron Curtain today as compared with 200 million people at the end of World War II, the Senator said. Criticizing American foreign policy, he stated, "the road to appeasement is not the road to peace. It is only surrender on the installment plan. . . . Just another note from our State Department to the Kremlin hierarchy will not impress these uncivilized rulers or the Russian people. . . . I strongly urge that the Soviet ambassador and his staff be sent home which will at least eliminate one center of espionage in the United States."

"There are some people who have mistakenly believed that the breaking of relations would necessarily be a prelude to conflict," the Senator continued. "It is my personal belief that such action would only restore the situation between the Soviet Union and the United States to precisely the same position it was under Presidents Woodrow Wilson, Warren Harding, Calvin Coolidge and Herbert Hoover. . . . It would also clearly indicate not only to the people of Russia, who were the first victims of Communist tyranny, that the Communist hierarchy of lawless, Godless men no longer was entitled to recognition in at least this free nation of the world."

The general meeting was addressed also by Leslie M. FitzGerald, president of the Association. Dr. FitzGerald stressed the importance of cooperative relations between the health professions.

"Dentistry must continue its close, cooperative relations with medicine, with public health, with nursing and with those working in hospital administration. Only if all of these professions work together can they focus their services on the total health of the individual human being," he said. As an example of the teamwork of the professions that has benefited the patient, Dr. FitzGerald cited the rehabilitation of the individual with cleft lip and cleft palate.

The Association president pointed to the tremendous advances in dentistry that have been made in the past few years. Anesthetics, modern dental equipment, "the high speed drill, the experimental use of ultrasonics in cutting tooth

structure and other developments that will come out of our laboratories give promise of even still greater achievements in producing a better dental service," Dr. FitzGerald concluded.

A telegram from President Dwight D. Eisenhower commending American dentists for demonstrating continued concern for the public well-being was read to the meeting. The telegram read in part, "By improving standards of dental education, promoting ethical practices, encouraging research, and by cooperating with private and governmental agencies to promote dental health, you are indeed performing a valuable service for the American people. Our nation looks to you for continued progress in your endeavors."

The meeting was preceded by a concert given by the University of Miami Symphony Orchestra.

PRESIDENT'S BANQUET

More than 700 persons attended a formal banquet and entertainment program honoring President and Mrs. Leslie M. FitzGerald at the di Lido Hotel November 10.

GUEST SPEAKERS

The demands of the Armed Forces for dental manpower, if continued at the present level, will seriously threaten dental care for the public, Howard A. Rusk, chairman of the Health Resources Advisory Committee of the Office of Defense Mobilization, said in his address before the House of Delegates November 11.

The ratio of dentists to troops in the Armed Forces is far higher than is the ratio for the civilian population. There are slightly less than two dentists for every 1,000 men in the Armed Forces, Dr. Rusk said. "For the entire United States, the ratio of active dentists to population is 0.5 per thousand. Thus civilians have available, on the average, only about a quarter as much dental service as the military," the health official added.

Although enrollment in the nation's dental schools has increased greatly in the past few years, the number of graduates available for military service might make it difficult to maintain the present ratio of dental manpower to members of the Armed Forces, Dr. Rusk continued. "Our studies bring out one simple fact," he said. "With the present and estimated supply of dentists available within the next few years, our national dental manpower resources are not sufficient to permit a continuation of the present level of staffing by the Armed Forces without some consequent reduction in the availability of civilian dental care."

INTERNATIONAL GUESTS

International visitors from all parts of the world attended the annual meeting and representatives of many dental societies brought greetings to the House of Delegates. Among those addressing the House were G. S. Cordero, president of the Mexican Dental Society; G. P. Anderson, president of the Canadian Dental Association; Emmett MacDermott, representing the Australian Dental Association; James Dyce, of the British section of the Fédération Dentaire Internationale; B. B. Eraña, president of the Philippine Dental Association; Raul Mena, dean of the School of Dentistry of the University of Havana, Cuba; Aiji Kaneda, official representative of the Japan Dental Association; Fermin Carranza and Julio C. Barrancos Mooney, of the Argentine Dental Association.

Other Guests • Other distinguished guests who addressed the House included Russell W. Bunting, dean emeritus of the University of Michigan, who outlined a program of civil defense training for den-

tists; Walter B. Martin, president of the American Medical Association, Oren Oliver, president of the Fédération Dentaire Internationale, Carl L. Sebelius, director of the dental health division of the Tennessee Department of Health and representative of the American Public Health Association, Edwin L. Crosby, director of the American Hospital Association, and Robert R. Mullen, executive director of the National Citizens' Committee for Educational Television.

INSTALLATION CEREMONIES

The gavel of the Association presidency was presented to incoming president Daniel F. Lynch by Leslie M. FitzGerald at the closing session of the House, November 11. Dr. Lynch presented Dr. FitzGerald with a certificate of recognition for his service to the Association, and Otto W. Brandhorst, immediate past president, welcomed him into the Past Presidents' Club of the Association.

ACTIONS OF THE BOARD OF TRUSTEES

The newly elected officers and trustees of the Association met immediately after the close of the annual session November 11. On the Board's agenda were the election of Council chairmen, the appointment of special committees and the selection of Association representatives to various national and international groups.

Percy T. Phillips, President Daniel F. Lynch and Charles H. Patton were reappointed as delegates to the National Health Council. The Health Council is a voluntary organization of some 60 groups interested in health matters.

Chosen to represent the Association on the Inter-Association Committee on Health were President Lynch, Percy T. Phillips, Kenneth A. Easlick and Harold Hillenbrand, Association secretary. The organizations on the Inter-Association Committee on Health, in addition to the American Dental Association, are the American Hospital Association, the American Medical Association, the American Nurses Association, the American Public Health Association and the American Public Welfare Association.

Dr. Hillenbrand was chosen to head the Association's delegation to the General Assembly of the Fédération Dentaire Internationale scheduled to meet in Copenhagen, Denmark, August 14-21, 1955. The rest of the delegation will be selected at a later date.

Chairmen of the various Councils are (new chairmen are indicated by asterisk*): Constitution and Bylaws, Fritz A. Pierson,* Nebraska; Dental Education, Philip E. Blackerby,* Michigan; Dental Health, David W. Brock, Missouri; Dental Research, Maynard K. Hine, Indiana; Dental Therapeutics, Lester W. Burket,* Pennsylvania; Dental Trade and Laboratory Relations, Walter E. Dundon,* Illinois; Federal Dental Services, Rudolph H. Friedrich, New Jersey; Hospital Dental Services, Frank B. Hower, Kentucky; Insurance, John S. Eiler,* New Mexico; International Relations, Oren A. Oliver, Tennessee; Journalism, William L. Barnum, Oregon; Judicial Council, Harry B. McCarthy, Texas; Legislation, Paul E. Jones,* North Carolina; Membership, John R. Wallace, Massachusetts; National Board of Dental Examiners, Victor L. Steffel,* Ohio; Registry of Dental and Oral Pathology, Kurt H. Thoma,* Massachusetts; Relief, Magnus C. Hansen, Wisconsin, and Scientific Session, Charles S. Kurz, Illinois.

Members of the Subcommittee on Civil Defense appointed by the Board are Carl Sebelius, Tennessee, chairman; John G.

Officers and members of the Board of Trustees who met just prior to the annual session were standing (l. to r.): John J. Hollister, business manager; C. Willard Camalier, assistant secretary; Bernard C. Kingsbury, Thirteenth District; Charles I. Taggart, First District; Edward R. White, Fourth District; Paul H. Jeserich, Ninth District; C. S. Renouard, Eleventh District; A. F. Schopper, Sixth District; C. H. Patton, Third District; Howard B. Higgins, Fifth District; William R. Alstadt, Twelfth District, Percy T. Phillips, Second District, and Louis M. Cruttenden, assistant secretary. Seated (l. to r.) are: Earl G. Jones, Seventh District; L. H. Jacob, Eighth District; Harold Hillenbrand, secretary; H. O. Warrick, third vice-president; Daniel F. Lynch, president-elect; Leslie M. FitzGerald, president; Walter J. Pryor, first vice-president; Charles A. Penkow, second vice-president; H. B. Washburn, treasurer; Lon W. Morrey, editor, and Lewis W. Thom, Tenth District.

Carr, New Jersey, and Lloyd Rogers, Michigan.

Personnel was selected also for the special committees on the survey of dentistry, Association headquarters and insurance program. Re-appointed to the Special Committee on Survey of Dentistry are Otto W. Brandhorst, Missouri, chairman; Willard C. Fleming, California; William N. Hodgkin, Virginia; Paul H. Jeserich, Michigan; Fritz A. Pierson, Nebraska; Percy T. Phillips, New York, and H. B. Washburn, Minnesota.

The membership of the Special Committee on Association Headquarters also was re-appointed. The Committee members are L. H. Jacob, Illinois, chairman; L. W. Thom, Minnesota, and H. B. Washburn, Minnesota.

Serving on the Special Committee on Insurance Program are C. S. Renouard, Montana, chairman; C. H. Patton, Pennsylvania; Arthur F. Schopper, Missouri, and Charles I. Taggart, Vermont.

The 1955 Special Committee on Trustee Districts is composed of Harold W. Oppice, Illinois, chairman; C. M. Taylor, Texas; W. N. Hodgkin, Virginia, John P. Looby, Pennsylvania; Henry M. Willits, Iowa, and John B. Wilson, California.

A committee of five, the personnel to be selected by the Association president, Daniel Lynch, will deal with problems in the field of oral surgery.

The Board set its second meeting for March 31 to April 2 and its third meeting September 8-10, both to be held in the Central Office, Chicago.

STATE SOCIETY OFFICERS CONFERENCE

The importance of the student membership program for the maintenance of high membership in the American Dental Association was stressed at the Conference of State Society Officers November 7 in Miami. A panel, moderated by John R. Wallace, chairman of the Association's Council on Membership, discussed the role of constituent societies in the student program.

The cooperation of all dental societies, including those in states which have no dental schools, is necessary for the success of the student program, John E. Buhler, dean of the School of Dentistry of Emory University, told the conferees. Societies can increase the interest of students in the affairs of organized dentistry by supplying speakers for student meetings and by cooperating with other societies in making the student realize that organized dentistry is concerned with his problems, Dr. Buhler said.

Methods for assuring that the student member becomes an active member were outlined by John G. Carr, secretary of the New Jersey State Dental Association. The New Jersey society, which has 82.4 per cent of the dentists in the state as members, sends a letter to each dentist who passes the state board examinations congratulating him on his success and urging him to take advantage of the benefits of society membership, Dr. Carr stated. Wherever possible, the letter is followed by personal visit.

Louis M. Cruttenden, assistant secretary of the Association, described the Association's program and pointed out that in recent years the transition from student to active membership has been complicated by the large number of graduates who enter the Armed Forces. Three-fourths of those students who have not joined a dental society are men who went into the Armed Forces, Dr. Cruttenden said, and a method must be devised to maintain their interest in organized dentistry during their service.

The afternoon session of the conference heard John R. Abel, chairman of the Association Committee on Civil Defense; Gerald M. McDonnel, M.D., of Walter Reed Hospital; Lt. Col. Russell W. Sumnicht, of Walter Reed Army Medical Center and Rear Admiral O. B. Morrison, Jr., of the office of the Assistant Secretary of Defense (Health and Medical), discuss the dentist's role in atomic bomb disaster.

"In the event of atomic attack," said Admiral Morrison, ". . . those such as the members of the dental profession, who have special qualifications in the health service field, have a particular responsibility." Pointing out that 23,500 trained personnel, not including professional men, will be needed to care for each 100,000 casualties, Admiral Morrison reminded the conferees that the dental profession by virtue of its education, experience and special skills was in a position to contribute greatly to the casualty care program.

A featured speaker was John E. Fauber, chief of the dental services of the Veterans Administration.

Other participants in the program were Frank B. Hower, chairman of the Association's Council on Hospital Dental Service, and William L. Barnum, chairman of the Association Council on Journalism. Dr. Hower spoke on hospital dental service and Dr. Barnum, speaking on dental publications, complimented state dental societies for the great improvement that has taken place in state dental journalism in the past decade and urged constituent society officials to increase their interest in and support of their publications.

Officers for the coming year, all elected by acclamation, are Edgar L. Bessette of Rhode Island, president; Fritz A. Pierson of Nebraska, vice-president, and Robert C. Frates of California, secretary.

AMERICAN DENTAL ASSOCIATION
95TH ANNUAL SESSION
November 8-11
Miami, Fla.

Policies to govern the affairs of organized dentistry for the coming year were set as the House of Delegates (background) considered more than 60 resolutions submitted by state societies, Association Councils and the Board of Trustees. Facing page, above left (l. to r.): the three vice-presidents, Walter J. Pryor, Charles A. Pankow and H. O. Warrick, look over the information desk with Wanda Nufert of the Central Office staff. Below left (l. to r.): B. B. Eraña, president of the Philippine Dental Association, presents a plaque to Leslie M. FitzGerald. In bringing greetings to the American Dental Association, Dr. Eraña said, "The United States is rightfully the leader in the field of dentistry . . . You set the patterns for us to follow." Center: Harry Lyons, Speaker of the House, rules on a point of order. This page, above: Bernard C. Kingsbury (left), who became president-elect of the Association, talks with Daniel F. Lynch, the new president. Below left: Dr. Lynch receives the official gavel from Dr. FitzGerald, retiring president, at the close of the annual session. Below right: Harold Hillenbrand, Association secretary, Dr. FitzGerald, and Curtis A. Haggard, chairman of the Local Arrangements Committee, look over the program of meetings, scientific sessions and entertainment events.

Association Affairs

FRANCIS GARVEY RESIGNS COUNCIL POST

Mr. Francis J. Garvey, secretary of the Council on Legislation for the past six years, has resigned from the Association's staff effective Dec. 31. He plans to engage in the full-time practice of law in California.

A native of Chicago, Mr. Garvey became Council secretary in December, 1948. Previously he had engaged in the private practice of law in Chicago and had served as chief of the legislative projects division of the Office of Legislation of the Veterans Administration in Washington, D. C.

Mr. Garvey is a graduate of the Loyola (Chicago) University Law School. From 1938 to 1939 he was a member of the Legislative Reference Bureau of the Illinois General Assembly. In 1941 and 1942 he was assistant secretary of the Illinois Senate.

During the period he served as Council secretary, Mr. Garvey was instrumental in developing and expanding the Association's legislative program. He has written numerous articles for dental society publications and has addressed annual meetings of more than a score of constituent dental societies and given talks at numerous component society meetings. One of his most recent assignments was that of a consultant to the Hoover Commission.

BUREAU LISTS BOOKS AND PACKAGE LIBRARIES

Books published between January 1949 and October 1954 and package libraries available from the Bureau of Library and Indexing Service have been listed in a catalogue which may be obtained free of charge from the Bureau at the Central Office, Donald Washburn, Bureau director, has announced. The catalogue, entitled *Books and Package Libaries for Dentists,* lists 415 books and 561 package libraries. A package library contains reprints and magazine clippings on a specific subject. Information on books published before 1949 or since October of this year will be furnished on request, Dr. Washburn said.

In addition to the new catalogue, the third quarter of the *Index to Dental Literature,* covering the period of January to September 1954, has been published. Some 4,568 articles including book reviews, obituaries and editorials have been indexed.

RELIEF FUND CONTRIBUTIONS REACH $42,919.75

Contributions to the Association's 1954-55 Relief Fund reached $42,919.75 on November 15, less than one month after the start of the drive. Contributions were running about $3,500 below the total for the same date a year ago.

There is an increase in the practice of sending a contribution to the Relief Fund in lieu of sending flowers to the family of a deceased person, it was reported recently. The Secretary's Office has requested that contributions of this nature be sent to the Secretary's Office for handling by the Council on Relief. Acknowledgement will be made to the donor, and the bereaved family will be notified of the contribution.

DAREDEVIL DAVEY BECOMES A DENTIST IN NEW BOOKLET

Daredevil Davey—I'm Going to be a Dentist is the title of the latest dental health comic issued by the Division of Dental Health Education of the Council on Dental Health. In this action-packed

booklet, Davey visits a Wild West town, finds the gangster Bull Hardpan terrorizing the townspeople and the marshal in bed with a toothache. Davey helps the marshal regain his health and restore law and order. Davey also points out the importance of dental health in today's world and reminds his young friends that whether they plan to be movie stars, ball players or lawyers they all need good teeth.

The booklet may be obtained from the Central Office Order Department at the following prices: 25 copies for $2.85, 50 copies for $5.15 and 100 copies for $8.25.

DENTAL EDUCATION COUNCIL SURVEYS SCHOOL APPLICANTS

The Council on Dental Education has begun a survey to determine the number of students from each state who apply for entrance to dental schools. Data is being collected from the schools to provide a picture of the national reservoir of persons available for dental training. The findings of the study will be helpful also in determining where to place new schools.

DENTAL FILMS URGED FOR AMERICAN FILM ASSEMBLY

All producers of dental films released in 1954 designed either for showing to the profession or the public are urged to submit their films for consideration at the American Film Assembly, to be held April 4-9 in New York City, announced Helaine Levin, American Dental Association film librarian. The Film Assembly is sponsored by the Film Council of America. Last year, Miss Levin stated, no films on dentistry were exhibited in the competition for the Golden Reel Awards. The Association film librarian again will serve as a judge for the film festival.

Film entry blanks must be submitted no later than January 15, 1955. Entry blanks may be obtained from the American Film Assembly, Film Council of America, 600 Davis St., Evanston, Ill. Last year's Assembly attracted more than 1,000 visitors. Some 360 films were exhibited.

U.S. DENTAL SCHOOLS TEACH STUDENTS FROM ABROAD

A total of 296 students from 62 countries attended U. S. dental schools during the 1953-54 school year, according to data collected by the Council on International Relations of the Association. They came from all parts of the globe, from places as far away as Malaya, Nigeria, Malta and Afghanistan. Two hundred and ten were enrolled in undergraduate work, 26 in graduate and 60 in postgraduate studies.

The largest number attended the College of Dentistry of New York University (71). The second largest number, 29, attended the College of Dentistry of Howard University. Thirty-three students came from Canada, 33 from Poland, 22 from Latvia and 16 from Germany.

Dental Societies

CHICAGO SOCIETY WINS SUIT AGAINST LABORATORIES

Injunctions restraining 25 Chicago dental laboratories from advertising to the public or dealing directly with the public were to have been signed November 30 in Cook County Superior Court. The action will climax a suit started by the Chicago Dental Society against a group of laboratories four years ago.

Superior Judge Frank M. Padden November 15 directed attorneys in the case to appear before him November 30 when, he said, he would issue permanent injunctions against the laboratories.

The suit, which has been watched as

a key test case by dental societies throughout the country, charged that the laboratory operators had violated the Illinois state dental practice act by soliciting business from the public through advertising in newspapers, neon signs and window displays. The suit charged also that the laboratories practiced dentistry by taking impressions, making and repairing dentures for the public.

Samuel Kleiman, president of the Chicago Dental Society, hailed the decision as a "great victory for public health."

THREE DAY MEETING SET FOR D. C. SOCIETY

The District of Columbia Dental Society will hold its 23rd annual postgraduate clinic March 13-16 at the Shoreham Hotel, Washington, D. C. Among the clinicians on the program are Col. Robert B. Shira, (DC) USA, speaking on oral surgery; Paul K. Losch of Boston, discussing pedodontics, and Carl R. Oman of New York on ultrasonic cutting of tooth structure.

PUERTO RICAN SOCIETY SCHEDULES JANUARY MEETING

The Colegio de Cirujanos Dentistas de Puerto Rico has announced that its 13th annual meeting will be held in San Juan January 26-29, 1955. The program includes lectures, practical demonstrations, table clinics and exhibits. Dentists interested in attending or in giving clinics should write to Lemuel de Jesus, secretary, Box 624, San Juan, Puerto Rico.

PREVENTIVE DENTISTRY IS WORKSHOP TOPIC

"Health Education and Preventive Dentistry in Industry" is the theme of the third public health workshop, sponsored by the First District Dental Society of the State of New York in collaboration with the Postgraduate Medical School of the Institute of Industrial Medicine, New York University. The conference will be held January 21, 1955, at the Hotel Statler in New York.

Among those participating in the workshop are: Anthony J. Lanza, professor emeritus of industrial medicine at New York University; Raymond J. Nagle, dean of New York University College of Dentistry; William A. Fennelly, president of the Dental Society of the State of New York; Edward R. Aston, industrial dental consultant, Bureau of Industrial Hygiene, Pennsylvania Department of Health, and Michael S. Burnham, president-elect of the First District Dental Society of the State of New York.

EIGHT CLINICIANS FEATURED AT DALLAS MEETING

Eight clinicians are featured on the program of the 28th annual Dallas Mid-Winter Dental Clinic to be held in Dallas, Texas, January 30, 31, February 1 and 2. The clinicians are Stanley D. Tylman of the University of Illinois College of Dentistry; Roland D. Fischer, an associate editor of the *Journal of Prosthetic Dentistry;* Louis I. Grossman of the School of Dentistry, University of Pennsylvania; William W. Demeritt of the University of North Carolina School of Dentistry; Thomas O. Burgess, Ph.D., of the American Board of Examiners in Professional Psychology; J. Lewis Blass of the New York University College of Dentistry; William E. Koch, Jr., Washington University School of Dentistry in St. Louis, and Col. Robert B. Shira, (DC) USA, chief of the oral surgery section at Walter Reed Army Hospital.

The table clinic program will be held at Baylor University College of Dentistry, and visitors will have the opportunity of seeing the new building, which was dedicated in October.

Dental Education

SCHOOLS SCHEDULE WINTER AND SPRING COURSES

Columbia • A course in temporomandibular joint disorders will be given February 23-25 by L. Laszlo Schwartz and associates at Columbia University School of Dental and Oral Surgery in New York. The diagnostic and therapeutic procedures developed at the temporomandibular joint clinic will be presented.

College of Physicians and Surgeons • A refresher program for the 1955 school year is offered by the College of Physicians and Surgeons in San Francisco. Included among the nine courses are dentistry for children, endodontics, periodontics and oral roentgenology. Additional information may be obtained from the postgraduate department at the school.

Illinois • One day television courses in periodontics and endodontics are being given by the University of Illinois College of Dentistry in Chicago early in February. The course in endodontics, presented by Ralph Sommer, Floyd Ostrander, Glenn Brooks and Mary Crowley, of the University of Michigan, will be televised February 4. The course in periodontics, directed by Balint Orban of Loyola University School of Dentistry, is scheduled for February 10. The television programs will include demonstrations on patients.

Iowa • A postgraduate course in pedodontics January 17-22, 1955, has been announced by the State University of Iowa College of Dentistry. Emphasis in the course will be on the practical psychological management of the child as well as on current technical procedures. Application may be made to Kenneth E. Wessels, department of pedodontics, College of Dentistry, Iowa City.

Loyola • Balint Orban will present a three day course on the theory and practice of periodontics at Loyola University School of Dentistry in Chicago January 20-22, 1955. Attendance is limited to 15.

Ohio • The College of Dentistry, Ohio State University, in Columbus, has arranged a series of postgraduate courses to be presented during the first six months of 1955. Included in the series is a new course, "Periodontology and Diseases of the Mouth on the Basis of Oral Pathology" by J. R. Wilson and H. B. G. Robinson. The series includes complete and partial denture prosthesis, endodontics, crown and bridge prosthesis, pedodontics and new advances in restorative dentistry. Further information may be obtained from the school in Columbus, Ohio.

St. Louis • St. Louis University School of Dentistry in St. Louis has announced a new postgraduate course in endodontics January 3-8. The method of endodontics developed by Victor H. Dietz will be presented, and each student will handle a clinical case in addition to attending lectures and seminars. Teaching will be Dr. Dietz, P. J. Ferrillo, J. W. Bynum, G. B. Travers, N. G. Grand, Lee Roy Main, W. H. Bauer and F. J. Gruchalla.

Tufts • Twenty graduate courses are scheduled for the winter months at Tufts College Dental School in Boston. These include the histopathology of oral disease, cephalographics and diagnosis, a participation course in periodontology, fractures of the facial bones and intravenous anesthesia for the dental office. In addition to these 20 courses, a series of six one-day courses for the general practitioner are offered in January.

Washington (Seattle) • "Theory and Practice of Periodontics" will be given

January 4-6 at the University of Washington School of Dentistry in Seattle under the direction of Balint Orban. The course will be presented by means of lectures, discussions and clinical demonstrations. At the conclusion of the course, students are invited to a dinner meeting at which round table discussions will be held. Staff members from the department of periodontology will participate with Dr. Orban in the discussions.

A second course offered by the school is entitled "Dental Therapeutics and Prescribing." The course, offered January 15 and 16, will correlate current views on the application, management and potential uses of drug therapy. Registrations will be accepted until January 8.

National Defense

FINAL DRAFT CALL UNDER SPECIAL LAW TO REACH 459

Selective Service will call 459 dentists in the three month period beginning in April and ending June 30, the Association was informed during the 95th annual session in Miami, Fla. On June 30, the special physician-dentist draft law will expire. Of the 459 to be called, 209 are for the Army and 150 for the Air Force.

ARMY TO SPONSOR RESEARCH AT EIGHT UNIVERSITIES

Ten dental research projects at eight universities will be sponsored by the Army it was announced late in October. The schools, projects and scientists who will conduct the research are:

University of Michigan, "Development and Growth of the Human Tooth," James K. Avery.

University of Minnesota, "Determination of Microquantities of Fluoride in Biological Materials," Wallace D. Armstrong.

Indiana University, "Fluorine in Nutrition and Dynamic State of Teeth and Bones," Harry G. Day; "Physical Structure of Dental Enamel and Bones," Robert B. Fischer; "Electrical and Thermal Conductivity of Dental Cements and Restorative Materials," R. W. Phillips.

Medical College of Virginia, "Effect of Local Irritants on Oral Tissues," Seymour B. Kreshover.

Tufts College Dental School, "Synthetic Dental Plaques Prepared from Strains of Oral Microorganisms," R. S. Manly.

University of Illinois, "Histochemical Studies of Dental Tissue," Milton B. Engel.

Harvard School of Dental Medicine, "Interrelations Between the Oral Hard Structures and Their Internal and External Environments in Health and Disease," R. S. Sognnaes and James H. Shaw.

New York University, "Apatites of Dental Enamel," Otto R. Trautz.

NAVY ANNOUNCES INTERNSHIP, SENIOR STUDENT PROGRAM

Rear Admiral Daniel W. Ryan has announced that the Navy will accept 18 dental students for next year's Navy dental internship program and 40 dental students for its senior dental student program. Students in present senior classes are eligible to apply for the internship program and those in this year's junior classes for the senior student program.

The internships are rotating and of 12 months' duration. Navy dental interns are commissioned lieutenant (jg) in the Navy dental corps, receive active duty pay during training and are required to serve on active duty for three years after graduation.

Under the senior student program, which commences in the fall of 1955, suc-

cessful candidates are appointed ensign in the Naval Reserve and receive active duty pay during their senior year. On completion of training, they are required to serve three years on active duty. As Senate confirmation for Navy appointments and the security check take three to four months, dates of application for both programs have been advanced. Applications for the intern programs should be submitted by January 15, those for the senior student program by February 1.

In addition to these two programs, the Navy offers to lower classmen a program under which the student receives the rank of ensign, inactive, protection from the draft, and service credit which may count for retirement purposes. An applicant must agree to accept appointments as lieutenant (jg) on graduation and serves on active duty for two years.

TWO DENTAL CORPS MEN PROMOTED BY ARMY

Promotions for two dental corps men were announced by the Army in October. Brig. Gen. James M. Epperly was promoted to permanent one-star rank and Col. D. B. Ridgely was promoted to temporary brigadier general. General Ridgely's appointment must be submitted for Senate approval.

General Epperly is director of dental activities in Brooke Army Medical Center, San Antonio, Texas. General Ridgely is chief of the dental service at Letterman Army Hospital in San Francisco. He is the fourth dental officer to be appointed to the rank of General.

FOUR FILMS PREPARED BY NAVY DENTAL SCHOOL

Four films in color, each about 20 minutes long, are being prepared by the U. S. Naval Dental School, Rear Admiral Ralph W. Taylor, the School's commanding officer, has announced. The first film, "Aseptic Procedure in Oral Surgery" has been completed and soon will be distributed to Navy dental facilities. The film shows the steps necessary to maintain isolation against bacterial invasion during oral surgery. The other films are entitled "The Rubber Dam in Dentistry," "Complete Dentures" and "Oral Prophylaxis."

Public Health

MAYOR OF PHILADELPHIA COMMENDS DENTAL PROFESSION

The advice and support of the dental profession was important in the acceptance and adoption of fluoridation in the city of Philadelphia, according to Mayor Joseph S. Clark.

In a letter to Charles H. Patton, Association Trustee from the Third District, Mayor Clark wrote, "As you know, Philadelphia is the largest health jurisdiction to carry out such a program to date, and we feel that this is a great step forward for our citizens and for the health of the country . . . there has been no substantial adverse public reaction to the program . . . the City departments concerned have received very few complaints about its effects. I feel that this good record resulted in large part from the educational work carried on with the general public prior to and during the program's adoption; and the help of the American Dental Association in this work was extremely important."

PALO ALTO VOTERS APPROVE FLUORIDATION PROJECT

Voters in Palo Alto, Calif., approved fluoridation for their community 7,560 to 6,214 in a referendum held November 2. An analysis of the vote showed that the largest number of profluoridation ballots were cast in those sections of the city where there are families with children. The vote climaxed a bitter campaign in which the profluoridation forces led by the junior Chamber of Commerce, physicians and dentists were opposed by the local chapter of Pure Water Association of America.

Fluoridation won also in Mountain Home, Ark., but was defeated in seven other communities. These communities were Salem, Ore.; Meadville, Pa., Greensboro, N.C.; Birmingham, Ala.; Atlantic City, N. J.; Fremont, Neb., and Sunnyvale, Calif.

International

URUGUAYAN STUDYING METHOD OF RESEARCH AT EASTMAN

Jose B. Costas, chief of pathology at the University of Montevideo Dental School, will spend ten months at the Eastman Dental Dispensary studying research methods in dentistry. Dr. Costas is a recipient of a United States Educational Foundation Exchange Grant and holds a fellowship also from the University of Montevideo.

ESSAYS, FILMS, TOUR PLANNED FOR PANHELLENIC CONGRESS

A program of essays, films and clinical exhibitions is planned for the Second Panhellenic Congress of the Stomatological Society of Greece to be held in Athens September 25-30. Four major subjects to be discussed are social dentistry, pedodontics, with emphasis on methods of dental health maintenance, periodontal diseases and root canal therapy.

The Fédération Dentaire Internationale is holding a special meeting in Athens at the time of the Panhellenic Congress, thus helping to make the Congress an international event.

In addition, the Greek society is planning a 16 day tour by ship to cities of interest in Greece. Information on the Congress and the tour may be obtained from B. Stefanopoulos-Vrettos, president of the Stomatological Society of Greece, 71 Skoufa St., Athens.

PHILIPPINE DENTAL SOCIETY HONORS AIR FORCE DENTISTS

The Philippine Dental Association in October presented a plaque to Col. Henry J. Tvrdy, Far East Air Force Command dental surgeon "in recognition of [the Far East Air Force's] interest in the dental arts and sciences of the Philippines." The presentation was made by Bienvenido B. Eraña, president of the dental society. Also attending the ceremony were A. C. Salcedo, chairman of the dental group's international relations committee and G. B. Felizardo, dean of the University of the East dental school.

BOMBAY DENTAL COLLEGE AFFILIATES WITH UNIVERSITY

The Nair Hospital Dental College has affiliated with the University of Bombay, V. M. Desai, dean of the college, has announced. A student who has passed the intermediate examination in science of the Bombay University or an examination of another body recognized as an equivalent is eligible to apply to the dental school. Some 60 students are admitted each year.

General

CHARLES BODECKER GIVEN JOHN R. CALLAHAN AWARD

Charles F. Bodecker, editor of the *New York State Dental Journal* and professor emeritus of the School of Dental and Oral Surgery of Columbia University, was presented with the John R. Callahan Award October 18. The award, given to Dr. Bodecker for his contributions to research and education in dentistry by the Ohio State Dental Society, was established in 1938 to honor outstanding dentists.

Dr. Bodecker's research has emphasized the relation between the health of the body and that of the teeth. He has stressed the importance of diet to dental health.

CARE CHRISTMAS PACKAGES SUGGESTED AS GOODWILL SIGN

Some 1,227,500 CARE Christmas packages, each containing 14 pounds of food, are available for shipment to hungry children and needy families in 32 countries, CARE has announced. All packages will be delivered before Christmas and are a sign to hungry people of the good will of Americans, CARE officials say.

As part of the cost of these packages is being borne by the Foreign Operations Administration, CARE is able to deliver two packages for a dollar. Contributions may be sent to "Food Crusade," CARE, New York, or to any local CARE office.

AAAS MEETING EXPECTED TO ATTRACT RECORD ATTENDANCE

With 18 sections and subsections of the American Association for the Advancement of Science and more than a score of other scientific organizations participating, a record attendance is expected at the December 27-30 meeting of the AAAS to be held on the Berkeley campus of the University of California. Between 3,500 and 4,000 scientists from all over the world will attend.

Dentistry, now an independent section of the AAAS, will have its own program December 28. Two themes, "Growth and Development" and "Radiation Hazards in the Dental Office," have been chosen. Participating in the symposium on growth and development are Wendell L. Wylie and Rodney Mathews of the College of Dentistry, University of California; Alton Moore of the College of Dentistry, University of Washington; Robert M. Ricketts, formerly of the College of Dentistry, University of Illinois, and Joseph C. Muhler of the College of Dentistry, University of Indiana.

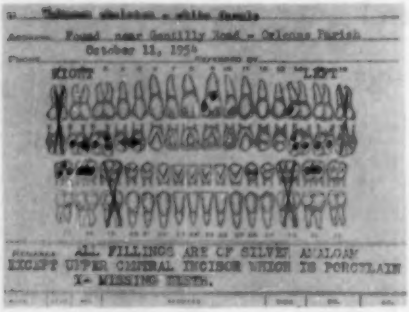
Radiation hazards in the dental office will be discussed by Gordon M. Fitzgerald of the College of Dentistry, University of California; R. Lowry Dobson of the radiological safety division, University of California; William E. Nolan of the radiation laboratory, University of California, and B. V. A. Low Beer of the medical school, University of California.

In addition, the film *Hazards of Dental Radiography,* produced by the National Bureau of Standards in cooperation with the American Dental Association, will be shown. Willard C. Fleming, dean of the College of Dentistry, University of California, is program chairman.

INFORMATION REQUESTED ON RETINITIS PIGMENTOSA

A letter has been received by the Central Office from a dentist suffering from retinitis pigmentosa requesting information regarding others who have had experience with the disease.

Because of the eye condition, the dentist writes, it has become increasingly


Found near Gentilly Road - Orleans Parish
October 11, 1954
RIGHT
LEFT
ALL FILLINGS ARE OF SILVER AMALGAM
EXCEPT UPPER CENTRAL INCISOR WHICH IS PORCELAIN
X- MISSING TEETH.

The skeleton of a woman, dead for about a year, was discovered recently on the outskirts of New Orleans. The skull contained teeth with dental work as shown on the chart. The cavity preparations on the lower right third molar do not appear to be typical. Information which might lead to identification of the woman should be forwarded to Capt. William J. Dowie, Sr., Homicide Division, Department of Police, 2700 Tulane Ave., New Orleans.

difficult to do fine mechanical work. He does not wish to leave dentistry and asks for information which "might help me plan my future value in the realm of dentistry." His major interests are in prosthetic dentistry, children's dentistry and teaching.

Persons having information which might prove useful are requested to forward it to Harold Hillenbrand, secretary, American Dental Association, 222 E. Superior St., Chicago.

TUFTS MIDWINTER MEETING TO FEATURE ONE DAY COURSES

The Tufts College Dental School Alumni Association will conduct its annual midwinter meeting in the form of a series of postgraduate courses March 9 and 10 in Boston. Some 28 courses, each of one day's duration, will cover such subjects as local anesthesia, practice management, direct inlay technic, gingivectomy. Further information on the midwinter meeting may be obtained by writing to the alumni association at Tufts College Dental School, Boston 11.

DENTISTS ASKED TO SEND SUPPLIES TO INDONESIA

An appeal for dental textbooks and instruments to be used by the American Gospel Mission of Indonesia has been received by the Association. Dental work there is hampered by lack of equipment. Supplies may be sent to J. G. Breman, M.D., P.O. Singkawang, Kalimantan Barat, Indonesia.

Also • The Pan-American Odontological Association will hold its 18th annual dinner meeting December 8 at the Waldorf Astoria Hotel in New York. The October issue of THE JOURNAL erred in reporting this meeting as the eighth meeting of the group. . . . December 5 is the date of the regional meeting of the International Academy of Oral Dynamics in New York. . . . The 47th annual convention of the Alpha Omega fraternity will be held December 28-31 in Detroit.

Organization of the new Congress by the Democrats in January, with important committee chairmanships falling to members of the majority party, provides a sure sign that consideration will be given to much legislation of interest and importance to dentistry.

Before the November elections, President Eisenhower had made it clear that he would continue to work for enactment of a law establishing federal reinsurance of health insurance contracts. Beyond that, he has not committed himself on health legislation. But the fact that Congressional control is to be taken by the Democrats will give them an opportunity to take the initiative. And no one in the capital doubts that they will seize the opportunity.

All health bills of national significance which were enacted into law by the 83rd Congress of 1953-54 bore a White House label. These included broadening of the Hill-Burton hospital expansion act, increased federal support of vocational and medical rehabilitation, strengthening of drug plant inspection authority and certain amendments to the social security and income tax laws. More health bills will be sent to the Congress by President Eisenhower next year, but the difference is that they will not necessarily receive priority of consideration by the committees which conduct hearings and perform the spadework.

Here are some of the proposals which are expected to be advanced soon, under Democratic sponsorship:

Federal financial aid for dental and medical schools, plus grants to provide for scholarships.

Amendment of the social security law to provide for permanent and total disability insurance.

Authorization of broad-scale financial assistance to state and local public health units.

Besides persevering in its effort to set up a reinsurance program, the Administration also is likely to recommend passage of bills to systematize medical and dental benefits for servicemen's dependents; to establish a permanent plan for medical and dental scholarships as an incentive for military service careers, and to inaugurate contributory health insurance coverage—on a voluntary basis—for federal employees.

And finally, there is more than a scant possibility that the Fair Deal bloc in House and Senate will try to get the ball rolling again for compulsory national health insurance. The two principal backers of compulsory health insurance, Senator James E. Murray (Mont.) and Representative John Dingell (Mich.) were reelected to Congress. So was another sponsor, Representative Emanuel Celler (N.Y.). The scheme has other champions on Capitol Hill but these three will occupy committee positions of greatest influence.

MEMORIAL FOR SENATOR HUNT

At a Senate memorial service conducted on November 9, the late Senator Lester C. Hunt was eulogized for his kindliness, his industry and his devotion to country. Republicans and Democrats alike gave expression to their sense of loss in the sudden passing, on June 19 of this year, of Wyoming's senior Senator.

"I never heard Lester Hunt utter a mean word, an uncharitable word, an ungenerous word, about any of his fellow men," said Senator Lyndon Johnson, of Texas. "He was too big of soul and too kindly of heart to enter into sordid squabbles over personalities."

"He could have been the senior

Senator from Wyoming as long as he lived or as long as he desired," said Senator Hermen Welker, of Idaho.

"I always had the feeling," said New York's Senator Herbert Lehman, "that he was just as much concerned with the problems and the welfare of New York State as he was with those of his own State of Wyoming."

Senator Robert C. Hendrickson, of New Jersey, recalled the successful efforts of Senator Hunt in raising the military dental services to higher administrative levels. Senator John C. Stennis of Mississippi, praised his fairness and courage: "His mind went immediately to the (problem's) basic elemental principles, and he considered them strictly on the merits in trying to find the correct answer. When he thought he had found that answer, he stood firmly by his convictions."

Others who eulogized Senator Hunt included Senators Estes Kefauver, of Tennessee; Earle C. Clements, of Kentucky; William F. Knowland, of California; Francis Case, of South Dakota; Frank Carlson, of Kansas; Mike Monroney, of Oklahoma; Harry F. Byrd, of Virginia; Spessard Holland, of Florida; John W. Bricker, of Ohio; J. Allen Frear, Jr., of Delaware; Frank A. Barrett, of Wyoming; Styles Bridges of New Hampshire; Leverett Saltonstall, of Massachusetts, and Edward Martin, of Pennsylvania.

MEDICAL TASK FORCE REPORT

The medical task force to the Hoover Commission held its final meeting in Washington November 5 and 6 and took final action on its studies and recommendations. A formal report is now being drafted for transmittal to the parent commission. The latter, in turn, will forward the report to Congress early in 1955.

Future federal policies, regulations and statutes dealing with dental services for veterans; medical, dental and hospital benefits for dependents of military personnel; procurement of dentists for the Armed Forces; government support of dental research—these are some of the subjects that were covered in the months of study which preceded drafting of the report.

The Hoover Commission of 1948, upon recommendation of its medical advisory group, urged Congressional establishment of a central federal agency that would administer virtually all of the government's health and hospital services. Whether the 1954 inquiry will produce the same recommendation is still conjectural.

International Correspondence

NEWS FROM GREAT BRITAIN

Menzies Campbell's unique collection of early dental instruments and articles may be seen by any dentist who has the opportunity of visiting Glasgow. Dr. Campbell welcomes visitors at his home in 70 Great George St. "I am always delighted to show the items in my collection freely to all interested persons," Dr. Campbell has said, "and I hope that many more transatlantic dentists will swell the number of those who have already seen them."

Dr. Campbell has a catalogue of 77 pages compiled as the outcome of years of intensive research, and as yet unpublished, covering the following sections: pelicans, elevators (punces, punches), keys, forceps, large cases of instruments, lancets, instruments for filling and filing teeth and removing calculus, artificial dentures, mirrors, toothbrushes, tooth picks, tokens and medals, pictures and instrument makers.

In addition to the catalogue, Dr. Campbell has a scrapbook of nearly 650 London and provincial dental advertisements dating from 1711 to 1850. Each is captioned with the name of the particular journal and the exact date on which it appeared. These advertisements tell a great deal about early dental practices, revealing as they do who taught the dentist his profession, what specialties were practiced, what claims were made by dentists of those days, what fees were charged and what types of premises were used by the profession.

Among the early books and pamphlets in the collection are: a manuscript with the Congress Certificate which protected the title of Eleazer Gidney's 1824 book; his certificate of membership in the American Society of Dental Surgeons, 1840, signed by Chapin A. Harris, and certain removal notices; Edwin Saunder's *Pamphlet on the Care of the Teeth* (1833); Edward Mile's *Popular Treatise* with rare Baxter print (1846); the *British Quarterly Journal of Dental Surgery* (complete), 1843, the first dental journal published in Great Britain; *Forceps* (complete), 1844-45, the second dental journal published in Great Britain; James's *Treatise on the Teeth* (1814); Hayward's *Conversations on the Teeth* (1834); E. King's *Treatise on Modern Dentistry* (1836); H. Well's *Essay on the Teeth* (1838); H. Preston's *Hints on the Teeth* (1848); a four page illustrated handbill issued by de Chemant in the 1790's, and an original manuscript by Dr. John Smith of the first comprehensive course of dental lectures to be delivered in Scotland (1856).

BRITISH DENTAL ASSOCIATION

In the 20 branches of the British Dental Association, elections by mail ballot are now taking place for representatives to the Representative Board, which is the governing body of the Association. Each branch is represented on the Board by its elected members and by the branch secretary, the minimum representation being two members for a branch of 250 members. These elections are held every three years, and the new Board will start its sessions at the beginning of next year.

The Representative Board is presided over by an elected chairman, who holds office for the life of the Board, which is three years. The Council of the Association is elected by the Representative Board at its inception and meets every month. The Representative Board numbering approximately 100 members meets four times a year. The president of the Association is elected every year and is installed at the annual meeting. Appointment to the presidency is the highest honor which the Association can confer, and the annual meeting is held in the branch in which he is a member.

The business of the Association is primarily carried out under the guidance of the chairman of the Representative Board and also of the Council. This situation is different from that in the dental associations of Europe, where the president of the association is the ruling head rather than the nominal head of his society, holding office sometimes for long periods and presiding at Council meetings.

Readers will be interested in the fact that the dental trade in Great Britain holds its own exhibition separate from the annual meeting of the British Dental Association. This year the exhibition was held in London October 26-29 and proved to be of considerable value to practitioners.

NATIONAL HEALTH SERVICE

A decision by the Ministry of Health made as a result of representation by the British Dental Association is of the greatest importance to the

dental profession and to hospital dentists in particular. A circular has been issued to all hospital authorities announcing revisions in the salary scales of hospital dental officers. The new salaries are comparable to those of hospital medical officers, and these changes are retroactive to April 1954. The decision to extend to the dental profession the increases previously awarded to medical staff should go far to remove a major source of the discontent felt by hospital dental staff during recent months. This means that a full-time dental consultant can reach the salary of £3,100 per annum.

The Faculty of Dental Surgery, Royal College of Surgeons of England, and the Institute of Dental Surgery, University of London, combine to hold a two month full-time course of clinical demonstrations and lectures in general, oral and dental surgery commencing in May and October each year. The first of such courses was held in 1950, and since then they have proved unique in the teaching and facilities offered to those who will devote the time needed for postgraduate study. The program just completed comprised lectures on general diseases of bone, preoperative and postoperative care in oral surgery, oral diagnosis, diseases of the salivary glands, cysts of the jaws, roentgenology of facial bones, actinomycosis, general anesthesia in dental operations, periodontics, oral manifestations of skin diseases, disorders of the mandibular joint, soft tissue infections of the face and neck, allergies and idiosyncrasies, the oral lactobacilli, complications after extractions, oral surgery in relation to malocclusion, malformation of the teeth, soft tissue complications of facial fractures, treatment of malignant tumors of the jaws, hereditary dental defects and facial pain.

Full details of the courses can be obtained by writing to the Secretary, Faculty of Dental Surgery, Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2.

Gerald H. Leatherman,
D.M.D., F.D.S.R.C.S.

Book Reviews

POWER OF WORDS

By Stuart Chase. 308 pages. Index. Price $3.95. New York, Harcourt, Brace & Co., 1954.

Because this book is written about the art of communication by one of the world's greatest authorities in that field, it may be expected to reflect the ultimate in the art of written communication, which it does.

As stated by the author its purpose is to interpret significant discoveries about language and communication and to point out applications of such discoveries and the need for further scientific study. The author explains how the verbal mechanism works, so far as scientists have dissected the process, and suggests a number of ways in which it might work better.

He outlines the general field of communications and illustrates how verbal communication relates to other communication forms. He describes in nontechnical language some interesting discoveries of communication engineers, brain physiologists, perception psychologists, linguists and grammarians. He discusses and analyzes the observations of child psychologists, animal psychologists, cultural anthropologists, mathematicians, semanticists, students of group dynamics and physicists, insofar as they are concerned with communication.

Because the author has the ability to translate these findings into plain everyday language and relate them to plain everyday use, the book is both entertaining and practical. Even if it is read for entertainment alone, the reader will close the cover on its 300 pages infinitely richer in the art of conversation and in the power that lies in words.

ORAL SURGERY

By Sterling V. Mead, D.D.S. Fourth edition, 1,478 pages with 872 illustrations, 13 in color. Index. Price $25. St. Louis, C. V. Mosby Co., 1954.

The dentists of the United States are familiar with Mead's previous editions of *Oral Surgery* and have found it a useful source of information. This fourth edition has been made more attractive by modernization and by a reorganization of the text. The book is divided into 35 chapters, and each subject is covered exhaustively. The result is considerable unnecessary repetition, and a text too large to read in comfort, but it does make the book a convenient reference.

The author presents his own ideas, instruments and procedure in adequate detail, but he has generously described methods and procedures employed by other oral surgeons and has given extensive references at the end of each chapter. Several pertinent case histories are presented. However, the book is pleasantly free from any long series of case reports. The illustrations are good, are closely associated with the text, and add considerably to the clarity of the description.

It is a good book for a student or a practitioner.

Charles W. Freeman

MODERN PRACTICE IN ANESTHESIA

By Frankis T. Evans, M.S. Second edition. 622 pages with 221 illustrations. Index. Price $12.50. New York, Paul B. Hoeber, Inc., 1954.

Modern anesthesiology demands an exceptionally wide knowledge and a variety of skills unknown a quarter of a century ago. This text, prepared with contributions from 26 collaborators, the majority of them practicing anesthesiologists in London, is a most complete exposition of scientific and practical anesthesia in all its aspects.

After a brief chapter on history and anatomy and the physiology of respiration, the volatile anesthetic gases are considered at length and in detail. Rectal, intravenous and spinal anesthesia are presented logically and with precision. In all chapters the chemistry and pharmacology of the agents are adequately dealt with, and the basic physiological processes which the anesthesiologist must consider are particularly well presented throughout the volume.

Chapter 15, entitled "Balanced Anesthesia," is an especially constructive discussion of combining premedication, local and general anesthesia for the patient's benefit. Chapters on postoperative care, anesthetic emergencies and blood transfusions are followed by 15 chapters on anesthetic problems in as many specific types of surgery. Throughout the text the cooperation between the anesthetist and the surgeon is stressed.

The authors give considerable attention to the various kinds of local anesthesia (called local analgesia) except in the chapter on anesthesia in dental surgery. This chapter is essentially a discussion of nitrous oxide anesthesia in the dental chair. Mention is made without enthusiasm of intravenous anesthesia in the dental office.

There is considerable duplication because of the many authors, but surprisingly little essential difference of opinion. One is impressed with the highly scientific approach to anesthesiology by this group of British authors, and perusal of the text would encourage a feeling of confidence in the quality of anesthetic administration in London hospitals.

The book is essentially for the specialist and is too inclusive to be particularly attractive to the practicing dentist, but it has very real merit, and the authors should be congratulated on a thoroughly scientific and practical text.

Charles W. Freeman

TABELLEN FÜR DIE KIEFERORTHOPÄDISCHE BEHANDLUNG (CHARTS FOR THE ORTHOPEDIC TREATMENT OF THE JAWS)

By Paul Sieberth, Dr. Third revised edition. 21 pages with 13 illustrations. Price 2.20 German Marks. Leipzig, Johann Ambrosius Barth, 1954.

The charts and tables in this pamphlet were collected from several works so that the busy dentist could refer to them quickly. The tables relate to the changing development of the teeth, the Pont index, articulation, formation of the jaws and occlusion at varying stages. One two-page table lists the fees set up by the German Association of Orthopedics of the Jaws for orthopedic services.

G. Nichols

DIE NARKOSE. EIN LEHR- UND HANDBUCH (NARCOSIS. A TEXT AND HANDBOOK)

By H. Killian, Dr., and H. Weese, Dr. 1,003 pages with 412 illustrations and 132 tables. Index. Price 170 German marks. Stuttgart, Georg Thieme, 1954.

This reference work, planned for use by both the teacher and the student, covers all the scientific, clinical and technical aspects of narcosis in relation to surgery, pharmacy and anesthesia. The scope of the text ranges from the history of the earliest developments in the use of narcotics to the newest advances in theory and practice. Abundant illustrations are used to demonstrate current technics and recently developed items of equipment.

Besides the practical knowledge on the subject of narcosis, this work provides a summary of the modern controversies and problems. It is the hope of the authors that this volume will afford an ample background for students of the subject and also will stimulate readers to further research.

G. Nichols

DIE ZAHN-, MUND- UND KIEFER-HEILKUNDE: EIN HANDBUCH FÜR DIE ZAHN-ÄRZTLICHE PRAXIS (THERAPY OF THE TEETH, MOUTH AND JAWS: A MANUAL FOR DENTAL PRACTICE)

Edited by Karl Häupl, Dr.; Wilhelm Meyer, Dr. Dr., and Karl Schuchardt, Dr. Dr. For sale only in complete set of volumes. München-Berlin, Urban & Schwarzenberg, 1954.

Issue 5. 144 pages with 315 illustrations, 9 in color.

Issue 5 is planned as part of the first volume, "Anatomy, Physiology, Pathology." As in previous parts of this monumental text, the illustrations are remarkable for their abundance and excellence. The complete set of volumes will make a valuable addition to dental literature, regardless of the language barrier. The sections appearing in this issue are:

"Topographische und praktische Anatomie des Mundhöhlenbereiches" (Topographical and Practical Anatomy of the Oral Cavity) by E. Pernkopf, Dr. (conclusion). The use of color in the illustrations of this section is unusually effective.

"Anatomie der Zähne und des Gebisses" (Anatomy of the Teeth and the Dentition) by Th. E. de Jonge, Dr. The illustrations in this summary of the description and form of the teeth are of the usual type.

"Histologie der Mundhöhle" (Histology of the Oral Cavity) and "Histologie der Zähne und des Gebisses" (Histology of the Teeth and the Dentition) by Wilhelm Meyer, Dr. Dr. The illustrations in these two sections constitute a distinct contribution to dental histology. More space is occupied with illustrations than with text. Some of the photomicrographs have been enlarged 8,000 times.

Issue 6. 160 pages with 161 illustrations.

Issue 6, planned as a continuation of the first volume, contains the final pages of "Histology

of the Teeth and the Dentition" and the following two additional sections on anatomy:

"Die Entwicklung der Mundhöhle" (The Development of the Oral Cavity) by G. Politzer, Dr. In this section the development of the jaw and of associated structures is traced from the earliest forms in the embryo. The illustrations are taken from wax models and photomicrographs.

"Entwicklung der Zähne und des Gebisses" (Development of the Teeth and the Dentition) by Wilhelm Meyer, Dr. The study of the development of the tooth germ and of the deciduous dentition is clearly presented in the 74 illustrations.

In addition, issue 6 contains the following sections on physiology:

"Ernährung und Verdauung. Innere Sekretion. Die chemische Untersuchung der Zähne" (Nutrition and Digestion. Inner Secretion. The Chemical Analysis of the Teeth) by H. D. Cremer, Dr.

"Mechanismus der Nahrungsaufnahme" (Mechanism of Absorption of Food) by R. Bolle, Dr. This section and the preceding one are summaries of general knowledge.

"Zur Physiologie von Stimme und Sprache" (The Physiology of the Voice and Speech) by F. Doubek, Dr. An unusual feature of this section is the diagram of the position of the organs in the production of alphabetical sounds.

"Sinnesempfindung in der Mundhöhle" (Sensory Perception in the Oral Cavity) by H. Hensel, Dr. Only two pages of this section appear in this issue.

G. Nichols

DIE ZAHN-, MUND- UND KIEFERHEILKUNDE: EIN HANDBUCH FÜR DIE ZAHNÄRZTLICHE PRAXIS (THERAPY OF THE TEETH, MOUTH AND JAWS: A MANUAL FOR DENTAL PRACTICE)

Edited by Karl Häupl, Dr.; Wilhelm Meyer, Dr. Dr., and Karl Schuchardt, Dr. Dr. For sale only in complete set of volumes. München-Berlin, Urban & Schwarzenberg (1953, 1954). Issue 7. 144 pages with 172 illustrations, several in color.

Issue 7 contains the following parts of Volume II of the projected series:

"Pharmakologie (Pharmacology)" by L. Lendle, Dr., and R. Weigmann, Dr. Last 6 pages.

"Röntgenologie (Roentgenology)" by Wilhelm Meyer, Dr. Dr. 64 pages with 125 illustrations. This section contains practical information on the principles of roentgen rays and their application in dentistry both for diagnosis and for treatment. The abundant roentgenograms are remarkable for their clarity and the specific information revealed in them. The chapter closes with the necessary word of caution as to the use of roentgen rays.

"Die Mikrobiologie der Mundhöhle (The Microbiology of the Oral Cavity)" by Franz Schütz, Dr., and Jörg Jensen, Dr. Incomplete, 74 pages with 47 illustrations, 9 colored. In this section considerable information is succinctly presented concerning methods of sterilization and disinfection, bacteria of the mucous membrane and bacterial causes of disease. The illustrations show the forms of various viruses, rickettsia and other microorganisms.

G. Nichols

KINDER-ZAHNHEILKUNDE UND JUGENDZAHNPFLEGE (DENTISTRY FOR CHILDREN AND YOUNG PEOPLE)

By Wilhelm Kessler. 429 pages with 183 illustrations. Index. Price 37 German Marks. Munich, Carl Hanser, 1953.

This book deals with the principles of pedodontics and dental care for young people. The latter subject concerns children attending kindergarten and schools in the age group of 3 to 18.

The author discusses the physiological development of the child and his teeth. There is a chapter on psychology of treating children and one on the problem of pain. Disturbances in eruption, shedding and retention of teeth are given attention.

No one reading this book could learn how to fill a deciduous tooth, but he would learn the knowledge basic to pedodontics. The book deals with speech difficulties. It deals also with legal questions arising in pedodontics.

There is a chapter on orthodontics written by William Schintz, a pedodontist and orthodontist. Special attention is given to prevention of disease and early treatment. Disturbances in the deciduous dentition are discussed and attention is given to problems arising through early loss of the deciduous teeth. The author does not go into detail as to methods of treatment, but a few simple appliances are shown and their use discussed. There is only a very short chapter on malocclusions of the permanent dentition.

An extensive bibliography enhances the value of this book.

Balint Orban

DIE OBJEKTIVE STEREOSKOPIE AN RÖNTGENBILDERN (THE STEREOSCOPIC PERSPECTIVE IN ROENTGENOGRAMS)

By A. Hasselwander, Dr. 187 pages with 125 illustrations. Index. Price DM 27. Stuttgart, Germany, Georg Thieme Verlag, 1954.

For many years the author has sought a method to make the interpretation of roentgenograms more objective and to eliminate the haziness which is characteristic of some details even in the clearest roentgenograms. His answer to these problems is the stereoscopic perspective.

In the first part of the volume the author explains scientifically the space concept of the stereoscopic perspective and traces the development of the equipment and the procedure. The principles of the technic are demonstrated in diagrams.

The second part of the volume is devoted to the evaluation of the stereoscopic perspective. The sketches in the final chapter were reproduced from the color lithographs of Wilhelm Braune, who incorporated the space concept into sketches he made of frozen sections of the human body.

Anyone interested in roentgenography will find this a fascinating volume.

G. Nichols

PULPA- UND WURZELBEHANDLUNG (PULP AND ROOT TREATMENT)

By Oskar Müller. 220 pages with 214 illustrations. 26 francs. Basel, Switzerland, Basel, Benno Schwabe and Co., 1953.

This book is one of the *Lehrbücher für Zahnheilkunde* series which is written not only to supplement the lectures and courses given to dental students but also for the practicing dentist. The author has reviewed various experimental investigations in endodontics and points out a number of problems which have been made evident by such research.

A method has been developed of coagulating the pulp under anesthesia by the use of a high frequency current, which generates almost no heat. But whether to use coagulation or devitalization must be based on histological evidence as to which method endangers the function of the periodontium the least.

The experiments have shown also how complicated and varying are the healing processes that take place in the apical region. For this reason, the author points out, root treatments should be avoided whenever possible and pulp conservation stressed. Following this reasoning he discusses thoroughly the handling of deep caries.

The methods of treatment advocated have been investigated and used in the dental school of the University of Basel. A bibliography of 306 references, the majority to European dental literature, is given. A fine collection of illustrations throughout the book cover many of the points discussed.

The book is divided into seven chapters: the treatment of dentin during cavity preparation, pulpitis, treatment of healthy and diseased pulp for their preservation, amputation of the pulp, extirpation of the pulp, filling the root canal, asepsis and antisepsis in root canal treatment.

D. Washburn

HYGIENE ET SOINS BUCCO-DENTAIRES DURANT LA PERIODE PRE-SCOLAIRE (ORAL HYGIENE AND CARE OF THE TEETH IN THE PRESCHOOL YEARS)

By Professors Bescombes, Boucher and others. 67 pages with illustrations. No price listed. Paris, Le Comité National D'Hygiène Bucco-Dentaire, 1952.

The purpose of this manual is to bring to the attention of practitioners, hygienists and students the importance of dental care for children of preschool age. The influence which conservation of the deciduous dentition has on the correct development of the jaws and permanent teeth is little understood, the authors believe.

Four chapters cover the oral examination of the child, treatment of the teeth before the age of six, treatment of the deciduous dentition after the age of six and orthodontic treatment and prophylaxis during the preschool period.

Information is given in digest form on such matters as the correct psychological approach to the child, development of the jaws and teeth, the relationship between oral health and the general health of the child, cleft palates, normal and pathological eruption of the teeth and treatment of caries.

The book is simply written, the diagrams are well done, the paper is of good quality and the print is large and readable. The manual is bound like a looseleaf notebook so that pages may be added. As the manual is intended to stimulate interest in the dental care of children and as the subject hardly can be covered adequately in 67 pages, it would have been helpful had a bibliography of suggested reading been added.

D. Zabin

Deaths

Allen, James M., Harrisburg, Va.; Ohio College of Dental Surgery, University of Cincinnati, 1915; died July 17; aged 60.

Ash, William, Williamsport, Pa.; College of Dental Surgery, Northwestern University, 1896; died July 31; aged 84.

Ballard, Clarence P., Santa Monica, Calif.; College of Dentistry, University of Southern California, 1917; died December 1, 1953; aged 60.

Bausch, Robert A., New York; School of Dentistry, University of Pennsylvania, 1936; died July 18, aged 44.

Berberich, Francis C., Brooklyn; Dental School, Tufts College, 1931; died July 22; aged 56.

Blomquist, Henry A., Wilmington, Del.; School of Dentistry, Temple University, 1934; died August 14; aged 46.

Bogart, Charles H., Troy, N. Y.; Philadelphia Dental College, 1895; died August 16; aged 82.

Bolt, Frank A., Knoxville, Tenn.; School of Dentistry, Indiana State University, 1925; died August 3; aged 65.

Brazill, Manuel J., New York; Philadelphia Dental College, 1899; died August 11; aged 79.

Brookes, Verne J., Schenectady, N. Y.; Chicago College of Dental Surgery, Loyola University, 1918; died July 20; aged 65.

Buckley, Joseph F., Rockville Centre, N. Y.; New York College of Dentistry, 1920; died August 4; aged 65.

Caldwell, Leland, Birmingham, Ala.; Birmingham Dental College, 1901; died July 14; aged 81.

Carle, Russell H., Yelm, Wash.; School of Dentistry, North Pacific College of Oregon, Portland, 1918; died August 19; aged 60.

Caron, Ferdinand M. H., Salem, Mass.; Dental School, Tufts College, 1897; died July 19; aged 88.

Carr, James B., Indianapolis; Indiana Dental College, 1905; died July 20; aged 72.

Cathcart, Robert J., Cincinnati; College of Dentistry, Western Reserve University, 1922; died August 8; aged 57.

Clements, Wilbur A., Forsythe, Mo.; Marion-Sims Dental College, St. Louis, 1904; died July 28; aged 70.

Coffey, Charles J., Mount Pleasant, Mich.; College of Dentistry, University of Illinois, 1909; died August 28; aged 79.

Collins, Walter W., Detroit; College of Dental Surgery, University of Michigan, 1927; died July 9; aged 49.

Cox, Gordon C., Germantown, Tenn.; College of Dentistry, University of Tennessee, 1925; died July 3; aged 62.

Curtis, Elwood A., Hicksville, N. Y.; College of Dental and Oral Surgery, New York, 1908; died July 30; aged 70.

Darrow, Harry N., Mount Vernon, N. Y.; School of Dentistry, University of Pennsylvania, 1905; died July 3; aged 71.

Davis, Robert I., Chelsea, Mass.; Dental School, Harvard University, 1897; died July 26.

De Jarnatt, Hale W., Centralia, Mo.; Western Dental College, Kansas City, 1900; died May 31.

Denzler, George J., Riverside, Calif.; College of Dentistry, University of Iowa, 1914; died July 6; aged 63.

De Pue, Frank A., Portland, Ore.; School of Dentistry, North Pacific College of Oregon, Portland, 1901; died August 15; aged 53.

Donnell, Clifton E., Indianapolis; Indiana Dental College, 1916; died July 22; aged 62.

Edgar, Chester C., Portland, Ore.; School of Dentistry, North Pacific College of Oregon, Portland, 1915; died in July; aged 65.

Faber, Walter J., St. Louis; School of Dentistry, Washington University, St. Louis, 1917; died June 19; aged 63.

Falk, Richard, Butler, N. J.; College of Dental and Oral Surgery, New York, 1919; died July 23; aged 56.

Fantozzi, Sam J., Chicago; College of Dentistry, University of Illinois, 1953; died August 7; aged 27.

Duffell, Harold W., Erie, Pa.; Dental School, Northwestern University, 1905; died July 10.

Eckley, James S., New York; New York College of Dentistry, 1890; died July 27; aged 92.

Ellis, Marvin M., Calhoun, Ga.; Southern Dental College, Atlanta, 1917; died July 12; aged 67.

Farley, Ross D., Oklahoma City; School of Dentistry, St. Louis University, 1919; died in May; aged 61.

Flannery, Edward E., Decatur, Ill.; Dental School, Northwestern University, 1911; died August 6; aged 64.

Flint, David W., Lake Worth, Fla.; School of Dentistry, University of Pittsburgh, 1898; died July 25; aged 79.

Gaertner, Arthur T., St. Louis; School of Dentistry, St. Louis University, 1917; died June 16.

Gallagher, James E., Columbus, Kan.; died August 13; aged 69.

Gibson, Jonathan E., Belington, W. Va.; Ohio College of Dental Surgery, University of Cincinnati, 1910; died in July; aged 73.

Habben, John I., New York; School of Dentistry, University of Pennsylvania, 1903; died in July.

Hall, Robert S., Lincoln, Neb.; Chicago College of Dental Surgery, Loyola University, 1906; died May 2; aged 74.

Hamilton, Baker A., Highland Park, Ill.; Dental School, Northwestern University, 1904; died August 18; aged 79.

Haskell, James G., Washington, D. C.; Dental Department, Columbian University, 1897; died July 28; aged 79.

Hatcher, Jerome C., Los Angeles; College of Dentistry, University of Southern California, 1928; died July 21; aged 51.

Hatfield, Chester T., Long Beach, Calif.; School of Dentistry, University of Pennsylvania, 1913; died May 20; aged 66.

Heaton, William S., Marshfield, Wis.; Chicago College of Dental Surgery, Loyola University, 1895; died in July; aged 80.

Henry, Carl S., Allentown, Pa.; Pennsylvania College of Dental Surgery, Philadelphia, 1901; died June 29; aged 79.

Hocker, William R., Kemmerer, Wyo.; Kansas City Dental College, 1911; died July 19; aged 63.

Hunt, Vernon L., Eureka, Calif.; College of Physicians and Surgeons, San Francisco, 1916; died September 5; aged 60.

Hunt, Walter W., Kansas City, Kan.; Kansas City Dental College, 1916; died August 2; aged 61.

Hussey, George A., Jr., Bristol, Pa.; School of Dentistry, University of Pennsylvania, 1917; died August 17; aged 60.

Jackson, Frank G., Mansfield, Ohio; College of Dentistry, Ohio Medical University, 1899; died July 28; aged 80.

Johnson, John E., Plymouth, Pa.; Pennsylvania College of Dental Surgery, Philadelphia, 1898; died in July; aged 78.

Kissell, Verner C., Marion, Ohio; Department of Dentistry, Starling-Ohio Medical College, 1910; died August 9; aged 68.

Kunzelmann, Louis, Washington, D.C.; Baltimore College of Dental Surgery, University of Maryland, 1919; died August 6; aged 66.

Langland, Raymond F., Madrid, Iowa; College of Dentistry, University of Iowa, 1919; died July 20; aged 37.

Laswell, Donald L., Decatur, Ill.; College of Dentistry, University of Illinois, 1927; died June 30; aged 53.

Listiak, Daniel A., Minneapolis; College of Dentistry, University of Minnesota, 1922; died August 16; aged 45.

Long, William S., Graham, N. C.; Baltimore College of Dental Surgery, University of Maryland, 1892; died July 26; aged 87.

Lord, Hunting J., Philadelphia; School of Dentistry, Temple University, 1919; died August 16; aged 63.

Lum, Frederick H., Jr., Chatham, N. J.; New York College of Dentistry, 1898; died August 22; aged 79.

MacVicar, Archibald, Saugus, Mass.; Dental Department, Baltimore Medical College, 1909; died August 7; aged 85.

Maguire, Ralph D., Albany, N. Y.; School of Dentistry, University of Buffalo, 1919; died July 12; aged 57.

Matthews, Edward W., Dennisport, Mass.; Dental School, Harvard University, 1896; died July 25; aged 80.

Metcalf, Otto F., Louisville, Ky.; Louisville College of Dentistry of Centre College, 1913; died July 24; aged 62.

Meyer, George G., Pittsburgh; Pittsburgh Dental College, Western University of Pennsylvania, 1905; died July 10; aged 75.

Moyer, Bertram A., St. Petersburg, Fla.; School of Dentistry, University of Buffalo, 1895; died August 7; aged 80.

Olson, Reuben M., Chicago; Dental School, Northwestern University, 1923; died August 12; aged 54.

Parker, John W., Pine Bluff, Ark.; Dental School, Northwestern University, 1905; died in July; aged 75.

Peters, Frederick C., Hastings, Pa.; School of Dentistry, University of Pittsburgh, 1914; died June 17; aged 61.

Pinion, Dayton D., Caruthersville, Mo.; School of Dentistry, Washington University, St. Louis, 1908; died June 17.

Ray, Herbert S., Chicago; Dental School, Northwestern University, 1918; died August 17; aged 59.

Roberts, Richard J., Erie Pa.; School of Dentistry, University of Pittsburgh, 1925; died August 8; aged 56.

Robinson, William R., Salem, N. J.; Pennsylvania College of Dental Surgery, Philadelphia, 1899; died August 8; aged 82.

Robison, John H., Great Bend, Kan.; Philadelphia Dental College, 1902; died August 19; aged 77.

Rogers, Russell W., San Francisco; College of Physicians and Surgeons, San Francisco, 1918; died August 21; aged 66.

Russell, Homer M., Ilion, N. Y.; School of Dentistry, University of Pittsburgh, 1915; died July 24; aged 64.

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THE JOURNAL OF THE AMERICAN DENTAL ASSOCIATION
222 East Superior Street, Chicago 11, Illinois
WHitehall 4-6730

LON W. MORREY, *Editor* JOHN J. HOLLISTER, *Business Manager*

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Announcements

MEETINGS OF THE AMERICAN DENTAL ASSOCIATION

Ninety-Sixth Annual Session	Oct. 17-20, 1955	San Francisco
Ninety-Seventh Annual Session	Oct. 1-4, 1956	Atlantic City, N.J.
Ninety-Eighth Annual Session		Miami, Fla.
Ninety-Ninth Annual Session		Dallas, Texas
One-Hundredth Annual Session		New York

MEETINGS OF CONSTITUENT SOCIETIES

State	Date	Place	Secretary	Address
Alabama	Apr. 4, 5, 1955	Birmingham	F. A. Finney, Jr.	1045 Forrest Ave., Gadsden
Alaska			R. M. MacKenzie	Alaska Native Service, Juneau
Arizona	Apr. 27-30, 1955	Grand Canyon	R. W. Christensen	17 E. Weldon Ave., Phoenix
Arkansas	Apr. 3-6, 1955	Little Rock	D. M. Hamm	Box 89, Clarksville
California	Apr. 16, 1955	San Francisco	L. R. Ludwigsen	430 Sutter St., San Francisco
S. California	May 9-11, 1955	Los Angeles	J. P. Bowers	124 W. Lime Ave., Monrovia
Colorado	Oct. 2-5, 1955	Colorado Springs	W. R. Humphrey	724 Republic Bldg., Denver
Connecticut	May 18-20, 1955	Hartford	E. S. Arnold	37 Linnard Rd., W. Hartford
Delaware	Jan. 12, 1955	Wilmington	R. J. Zurkow	152 S. State St., Dover
District of Columbia			Z. B. Lloyd	2007 R St., N.W., Washington
Florida	Apr. 24-27, 1955	Jacksonville	J. E. Edwards	152 Alhambra Circle, Coral Gables
Georgia	Oct. 2-5, 1955	Atlanta	J. W. Yarbrough	Bibb Bldg., Macon
Hawaii	June 15-18, 1955	Honolulu	J. H. Dawe	810 N. Vineyard St., Honolulu
Idaho	May 19-21, 1955	Coeur d'Alene	F. O'Halloran	Box 703, Coeur d'Alene
Illinois	May 9-12, 1955	Peoria	P. W. Clopper	623 Jefferson Bldg., Peoria
Indiana	May 16-18, 1955	Indianapolis	D. C. Barnhill	400 Bankers Trust Bldg., Indianapolis
Iowa	May 1-4, 1955	Des Moines	H. I. Wilson	639 Insurance Exchange Bldg., Des Moines
Kansas	May 15-18, 1955	Kansas City, Mo.	F. A. Richmond	861 Brotherhood Bldg., Kansas City
Kentucky	Apr. 18-21, 1955	Louisville	A. B. Coxwell, Jr.	1976 Douglass Blvd., Louisville
Louisiana	Apr. 13-16, 1955	New Orleans	J. S. Bernhard	2515 Line Ave., Shreveport
Maine	June 23-25, 1955	Rockland	S. M. Gower	Box 27, Skowhegan
Maryland	May 2-4, 1955	Baltimore	E. L. Pessagno, Jr.	415 Medical Arts Bldg., Baltimore
Massachusetts	May 1-4, 1955	Boston	H. E. Tingley	12 Bay State Rd., Boston
Michigan	Apr. 18-20, 1955	Detroit	F. Wertheimer	Michigan Dept. of Health, Lansing
Minnesota	Mar. 28-30, 1955	Minneapolis	C. V. E. Casse	225 Hamm Bldg., St. Paul
Mississippi	Apr. 24-27, 1955	Jackson	B. A. Cohen	306 Plaza Bldg., Jackson
Missouri	May 15-18, 1955	Kansas City	E. D. Sugget	201 Merchants Bank Bldg Jefferson City
Montana	May 5-7, 1955	Bozeman	E. G. Vedova	Roundup
Nebraska	May 9-12, 1955	Lincoln	F. A. Pierson	1112 Federal Securities Bldg., Lincoln
Nevada	June 10-12, 1955	Lake Tahoe	O. M. Seifert	506 Humboldt St., Reno
New Hampshire	June 12-14, 1955	Whitefield	F. E. Williams	814 Elm St., Manchester
New Jersey	Apr. 18-20, 1955	Atlantic City	J. G. Carr	407 Cooper St., Camden
New Mexico	May 22-25, 1955	Ruidoso	J. S. Eilar	Medical Arts Square, Albuquerque
New York	May 16-18, 1955	New York	C. A. Wilkie	1 Hanson Place, Brooklyn
North Carolina	May 15-18, 1955	Pinehurst	R. D. Coffey	Kibler Bldg., Morganton
North Dakota	May 1-4, 1955	Grand Forks	V. B. Keltgen	517 de Lendrecie Bldg., Fargo
Ohio	Nov. 13-16, 1955	Cleveland	E. G. Jones	185 E. State St., Columbus
Oklahoma	Apr. 20, 1955	Tulsa	S. A. Ruseman	809 Medical Arts Bldg., Oklahoma City
Oregon	Mar. 7-9, 1955	Portland	T. D. Holder	308 Selling Bldg., Portland
Panama Canal Zone			A. L. Teitel	Box D, U.S. Naval Station, Rodman
Pennsylvania	May 16-18, 1955	Philadelphia	M. D. Zimmerman	217 State St., Harrisburg
Puerto Rico	Jan. 26-29, 1955	San Juan		Box 624, San Juan
Rhode Island	Jan. 1955	Providence	B. C. Friedman	2 Ayrault St., Newport
South Carolina	May 22-24, 1955	Charleston	J. R. Owings	7 Medical Court, Greenville

State	Date	Place	Secretary	Address
South Dakota	May 15-17, 1955	Aberdeen	L. N. Thelen	310A W. 18th St., Sioux Falls
Tennessee	May 8-12, 1955	Nashville	A. M. Ballentine	Pulaski
Texas	May 1-5, 1955	San Antonio	W. Ogle	3607 Gaston Ave., Dallas
Utah	Apr. 21-23, 1955	Ogden	R. C. Dalgleish	124 State Capitol Bldg., Salt Lake City
Vermont	May 30-June 1, 1955	Manchester	W. J. Reardon	18 Madison St., Rutland
Virginia	Apr. 29-May 6, 1955	Havana, Cuba	W. T. McAfee	705 Colonial National Bank Bldg., Roanoke
Washington	Mar. 24-26, 1955	Seattle	W. B. Martin	Medical-Dental Bldg., Seattle
West Virginia	July 24-27, 1955	White Sulphur Springs	G. N. Casto, Jr.	710½ Lee St., Charleston
Wisconsin	Apr. 25-27, 1955	Milwaukee	A. E. Kopp	Wells Bldg., Milwaukee
Wyoming	June 16-18, 1955	Cheyenne	T. J. Drew	State Office Bldg., Cheyenne

MEETINGS OF STATE BOARDS OF DENTAL EXAMINERS

State	Date	Place	Secretary	Address
Alabama	June 20-24, 1955* June 20, 21, 1955†	Birmingham	W. L. McCarty	200 Professional Center, Montgomery
Alaska			R. H. Williams	Box 2122, Juneau
Arizona			R. K. Trueblood	107 East A Ave., Glendale
Arkansas	June 20-24, 1955*†	Little Rock	H. O. Weatherly	205 Halter Bldg., Conway
California	Feb. 7, 1955	San Francisco	T. E. Tilden	Medico-Dental Bldg., Sacramento
	June 20, 1955	Los Angeles		
	July 25, 1955	San Francisco		
Colorado			J. M. Peabody	724 Republic Bldg., Denver
Connecticut	Dec. 5-11*†	New York Bridgeport	C. G. Brooks	302 State St., New London
Delaware			P. K. Musselman	143 W. Main St., Newark
District of Columbia			W. T. Birthright	Suite 718, 1835 Eye St., N.W Washington
Florida	July 11-21, 1955*†	Jacksonville	A. W. Kellner	P. O. Box 155, Hollywood
Georgia			P. M. McNeil	307 First National Bank Bldg., Rome
Hawaii	Feb. 17-20, 1955	Honolulu	H. L. Houvener	427 Dillingham Bldg., Honolulu
Idaho			R. E. Blickenstaff	1023 Fourth St., S., Nampa
Illinois			W. A. McKee	503 Wood Bldg., Benton
Indiana	Dec. 6-9	Indianapolis	C. A. Frech	504 Broadway, Gary
Iowa	May 23-27, 1955‡		D. J. FitzGerald	615 Brick & Tile Bldg., Mason City
Kansas	Jan. 24-27, 1955*	Kansas City, Mo.	G. L. Teall	Box 71, Hiawatha
	Jan. 25, 26, 1955†			
Kentucky			R. M. Justice	1330 Central Ave., Ashland
Louisiana			R. C. Steib	833 Maison Blanche Bldg., New Orleans
Maine			R. A. Derbyshire	Box 387, Skowhegan
Maryland	Nov. 29-Dec. 1‡		H. Levin	3429 Park Heights Ave., Baltimore
Massachusetts	June 13-16, 1955*‡		G. J. Fink	Rm. 33, State House, Boston
	June 15, 16, 1955†‡			
Michigan	Jan. 23-29, 1955	Ann Arbor	J. L. Champagne	3714 W. McNichols Rd., Detroit
	June 5-11, 1955			
Minnesota	Jan. 10-14, 1955*†‡		M. G. Walls	615 Montcalm Place, St. Paul
	June 13-17, 1955*†‡			
Mississippi	Jan. 4-6, 1955	Jackson	J. C. Boswell	508 Lamar Life Bldg., Jackson
	June 21-23, 1955			
Missouri			R. R. Rhoades	414 Central Trust Bldg., Jefferson City
Montana			V. J. Quinn	301 Phoenix Bldg., Butte
Nebraska			H. E. Weber	1210 Federal Securities Bldg., Lincoln
Nevada	Dec. 6	Las Vegas	R. Whitehead	Suite 6, Masonic Temple, Reno
New Hampshire	Dec. 12*	Concord	S. G. Markos	8 Renaud Ave., Dover
New Jersey	Nov. 29, 30*	Philadelphia	W. A. Wilson	150 E. State St., Trenton
	Dec. 1, 2*	Trenton		
	Nov. 29, 30†	Philadelphia		
New Mexico			J. J. Clarke, Sr.	Artesia
New York	Feb. 10, 11, 1955*‡		D. W. Beier	23 S. Pearl St., Albany
	Feb. 15-18, 1955*‡			
	Feb. 10, 1955†‡			
	Feb. 15, 16, 1955†‡			
North Carolina			F. O. Alford	1109 Liberty Life Bldg., Charlotte
North Dakota	June 20-24, 1955	Fargo	A. L. Pushor	Lisbon
Ohio			H. B. Smith	322 E. State St., Columbus

State	Date	Place	Secretary	Address
Oklahoma			R. P. Keidel	403 Surety Bldg., Muskogee
Oregon	Dec. 16-18*‡	Portland	F. L. Utter	506 Pioneer Trust Bldg., Salem
Pennsylvania	Dec. 6-11 Dec. 6-8 June 20-25, 1955 June 20-22, 1955	Philadelphia Pittsburgh Philadelphia Pittsburgh	A. M. Stinson	Dept. of Public Instruction, Box 911, Harrisburg
Puerto Rico			J. Mercado C.	Box 3717, Santurce
Rhode Island			F. M. Hackett	267 Academy Ave., Providence
South Carolina	Jan. 27-29, 1955	Columbia	T. C. Sparks	1315 Pickens St., Columbia
South Dakota	Jan. 9-12, 1955	Sioux Falls	H. T. Aker	Canton
Tennessee			C. R. Aita	619 Bennie Dillon Bldg., Nashville
Texas			R. T. Weber	312 Capital National Bank Bldg., Austin
Utah			D. L. Folsom	1101 First Security Bank Bldg., Salt Lake City
Vermont			P. M. Fitch	Newport
Virginia	June 6-11, 1955* June 6, 7, 1955†	Richmond	J. M. Hughes	715 Medical Arts Bldg., Richmond
Washington			M. L. Mower	National Bank of Commerce Bldg., Olympia
West Virginia			C. A. Laughlin	613 Prunty Bldg., Clarksburg
Wisconsin	June 13-17, 1955*†	Milwaukee	S. F. Donovan	Tomah
Wyoming			W. A. Hocker	212 O & S Bldg., Casper

Most states require applications to be in 30 days prior to examination date.
*Dental examination. †Dental hygiene examination. ‡Write to secretary of dental examining board for information on locations of examinations. §Approximate dates—verify with state dental examining board.

MEETINGS OF OTHER ORGANIZATIONS

Name	Date	Place	Secy. or Chm.	Address
Academy of Denture Prosthetics	May 8, 1955	New York	I. L. Furnas Secy.	928 Silverado St., La Jolla, Calif.
American Academy of Dental Medicine	Dec. 5	New York	W. M. Greenhut Secy.	124 E. 84th St., New York
American Academy of Restorative Dentistry	Feb. 5, 6, 1955	Chicago	A. G. James Secy.	409 N. Camden Drive, Beverly Hills, Calif.
American Association for the Advancement of Science, Section on Dentistry	Dec. 28	Berkeley, Calif.	R. W. Bunting Secy.	2224 Vinewood Blvd., Ann Arbor, Mich.
American Association of Dental Schools	Mar. 21-23, 1955	Chicago	M. W. McCrea Secy.	Baltimore College of Dental Surgery, University of Maryland, Baltimore
American Association of Endodontists	Feb. 5, 6, 1955	Chicago	V. B. Milas Secy.	2559 W. 63rd St., Chicago
American Association of Industrial Dentists	Apr. 26-28, 1955	Buffalo	E. R. Aston Secy.	South Office Bldg., Harrisburg, Pa.
Chicago Dental Society	Feb. 6-9, 1955	Chicago	K. S. Richardson Exec. Secy.	30 N. Michigan Ave., Chicago
Cincinnati Dental Society Clinic	Mar. 27-29, 1955	Cincinnati	W. C. Jolly Secy.	403 Tracton Bldg., Cincinnati
Council on Dental Education, Dental Aptitude Tests	Jan. 14, 15, 1955		S. Peterson Secy.	222 E. Superior St., Chicago
Dallas Mid-Winter Dental Clinic	Jan. 30-Feb. 2, 1955	Dallas, Texas	J. E. Myers Chm.	2518 Welborn, Dallas, Texas
Denver Dental Association Midwinter Meeting	Jan. 9-12, 1955	Denver	B. Kletzky Secy.	724 Republic Bldg., Denver
District of Columbia Postgraduate Clinic	Mar. 13-16, 1955	Washington, D.C.	E. M. Colvin, Jr. Gen. Chm.	1726 21st St., N.W., Washington, D.C.
Federation Dentaire Internationale	Aug. 14-20, 1955	Copenhagen, Denmark	G. H. Leatherman Secy. Gen.	35 Devonshire Place, London, England
Greater New York Dental Meeting	Dec. 6-10	New York	M. Purdy Exec. Secy.	Rm. 106A, Hotel Statler, New York
Greater Philadelphia Annual Meeting	Feb. 2-5, 1955	Philadelphia	R. Adams Secy.	337 Bellevue-Stratford Hotel, Broad and Walnut Sts., Philadelphia

Name	Date	Place	Secy. or Chm.	Address
International Association for Dental Research	Mar. 18-20, 1955	Chicago	E. H. Hatton Secy.	2419 Simpson St., Evanston, Ill.
International Academy of Oral Dynamics, Regional Meeting	Dec. 5	New York	J. T. McSweeney Chm.	140 E. 80th St., New York
National Board of Dental Examiners	Dec. 6, 7		G. J. Casey Secy.	222 E. Superior St., Chicago
Seminario Anual del Grupo de Estudios Dentales U. S. C. De Mexico	May 15-19, 1955	Tehuacan, Puebla, Mex.	R. S. deLascurain Secy.	Insurgentes 257-10, Mexico, D.F.

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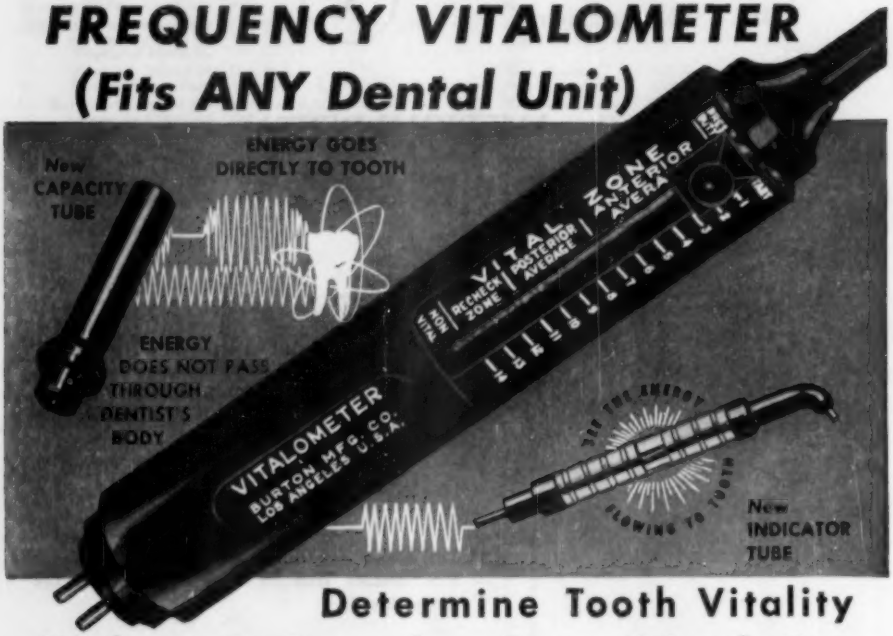

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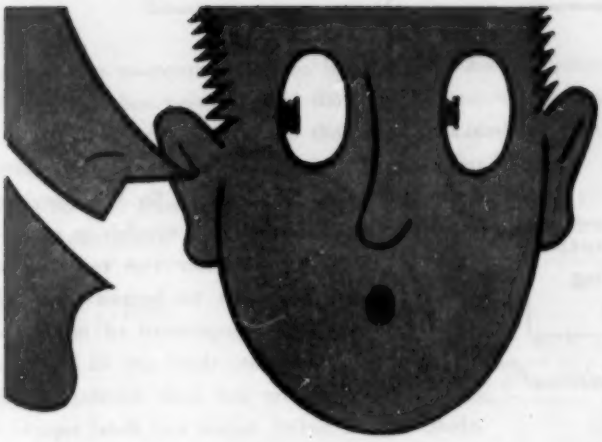

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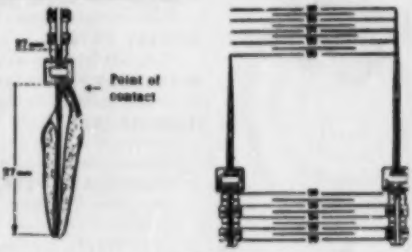

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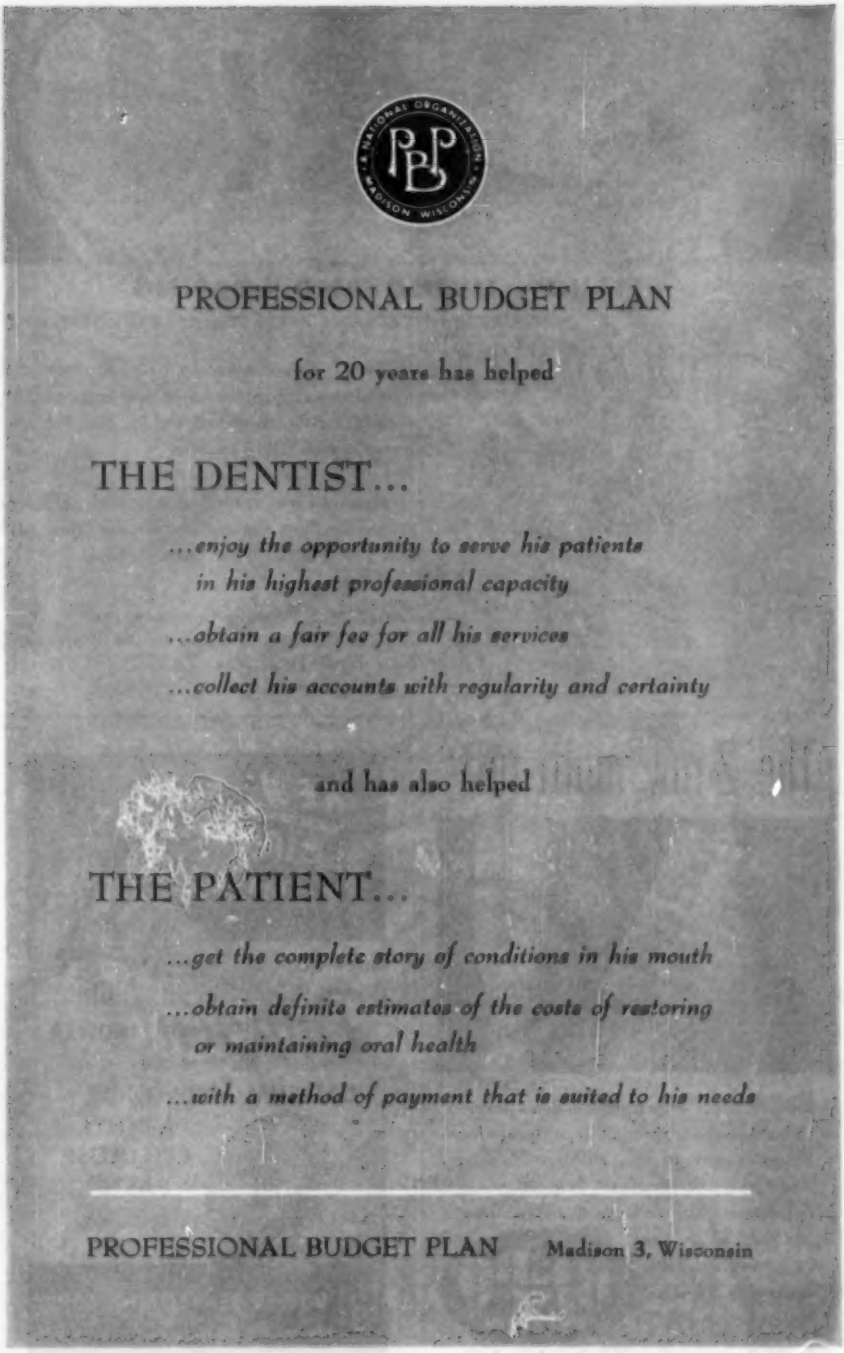
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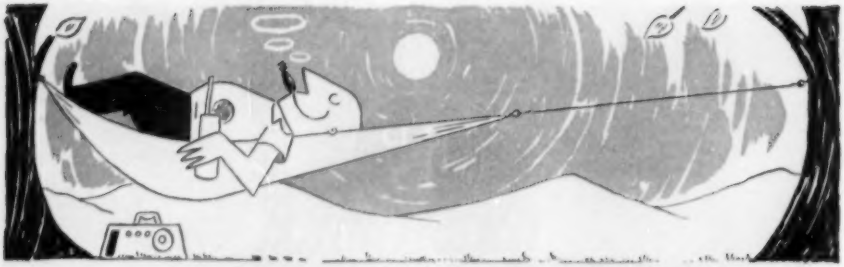

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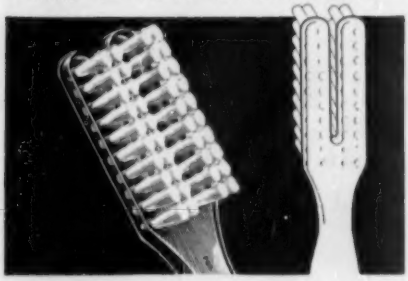

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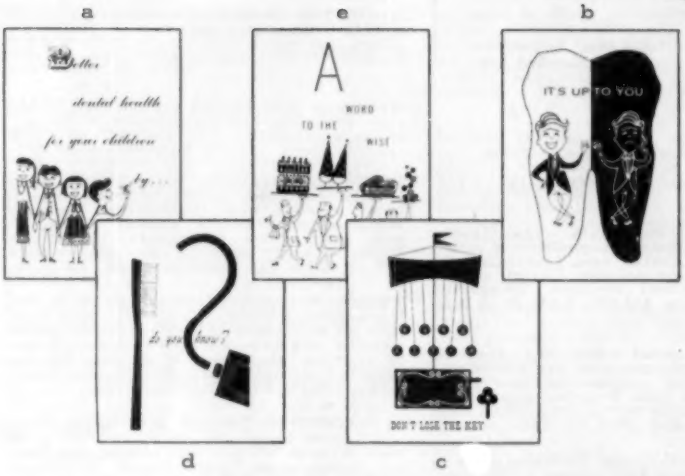

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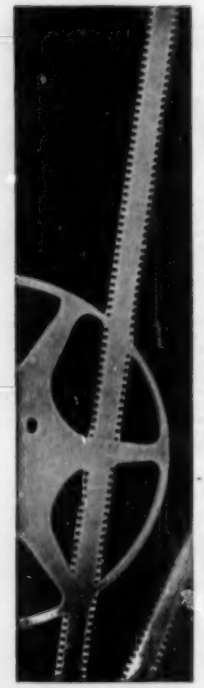

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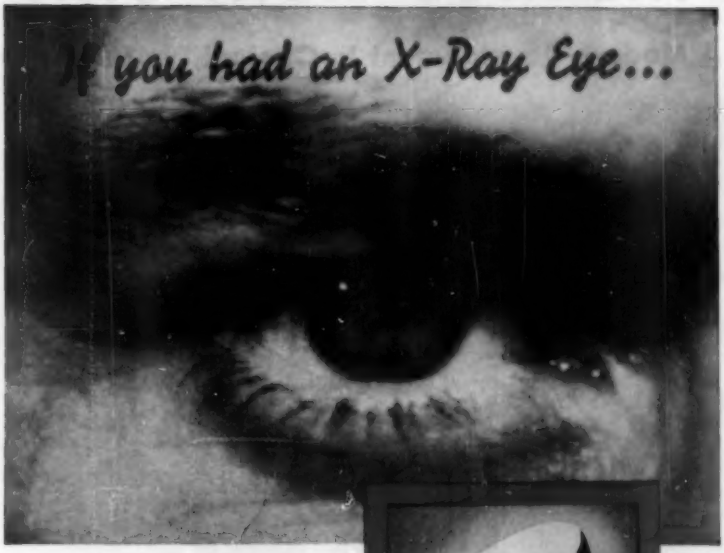

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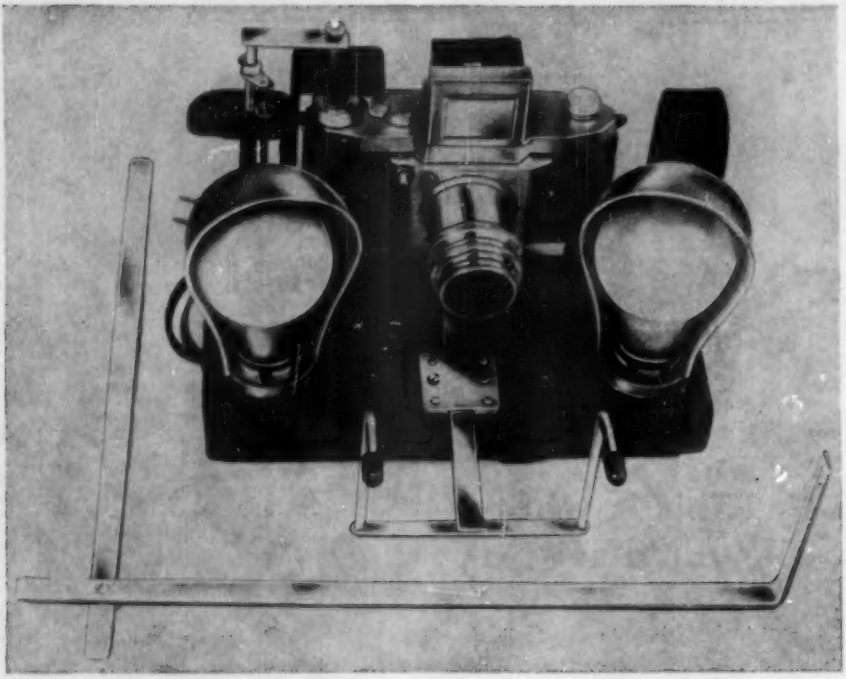

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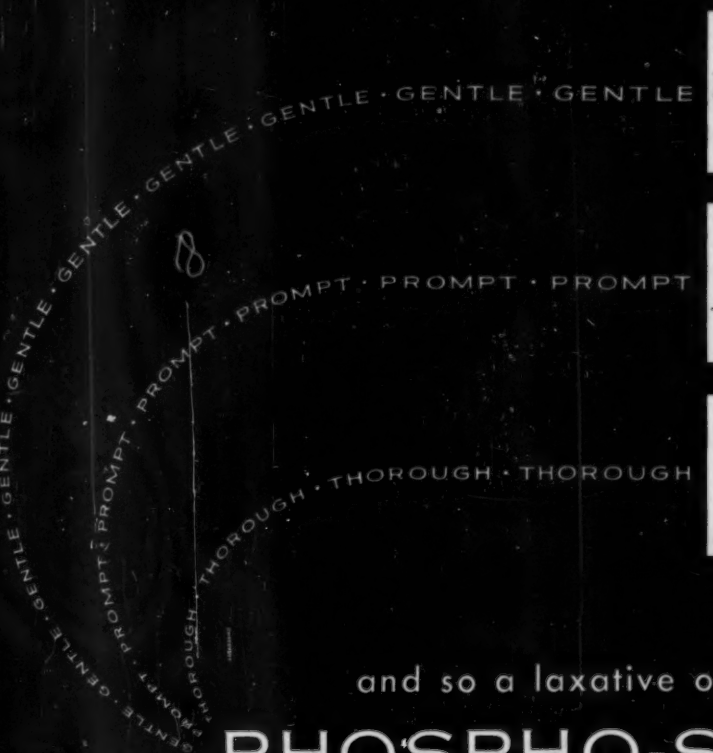

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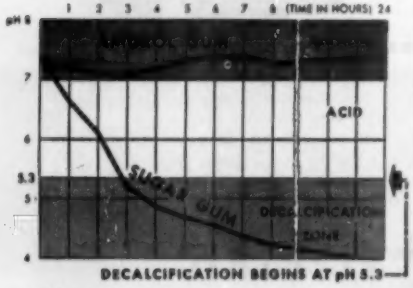

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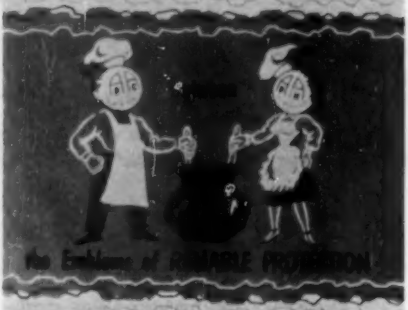

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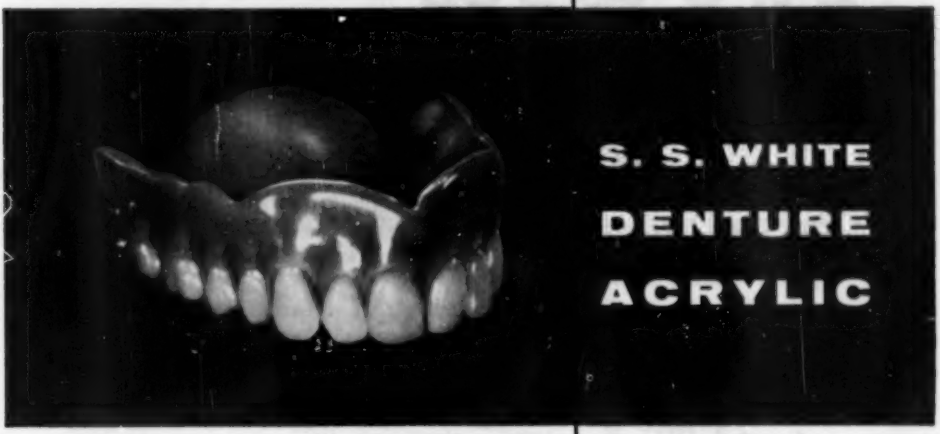

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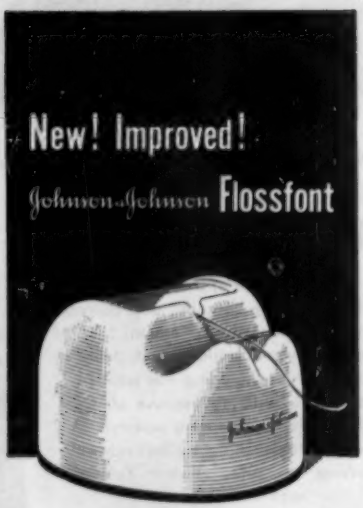

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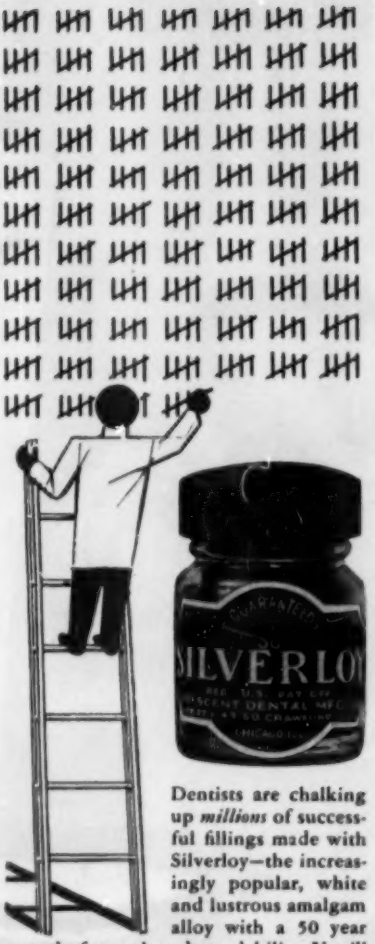

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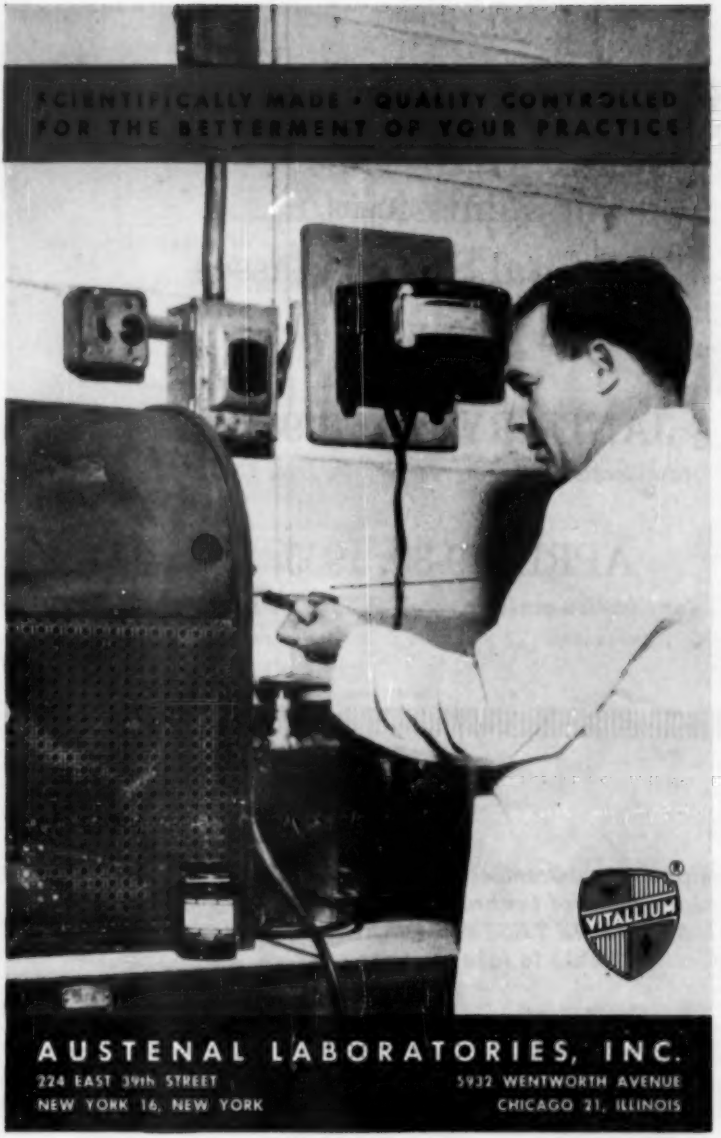
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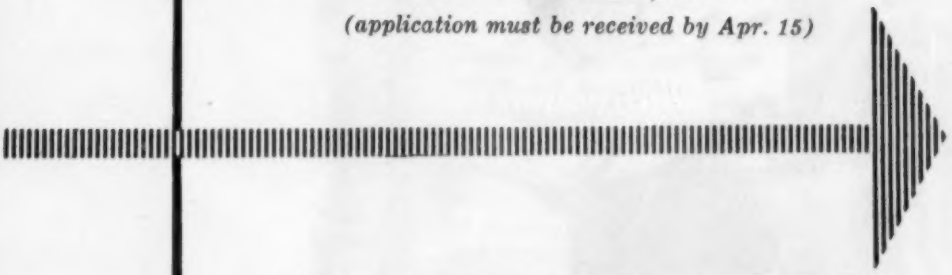

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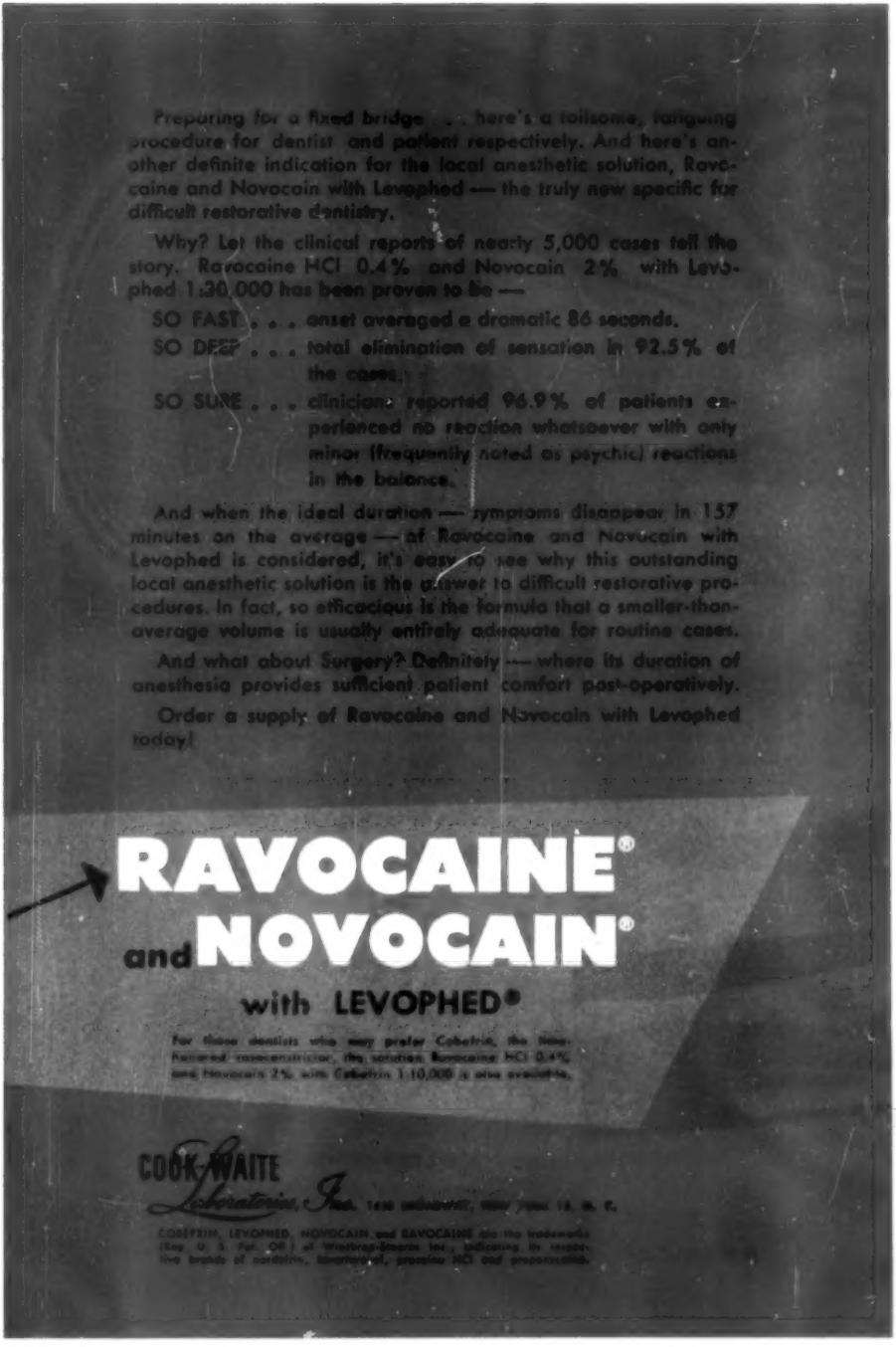

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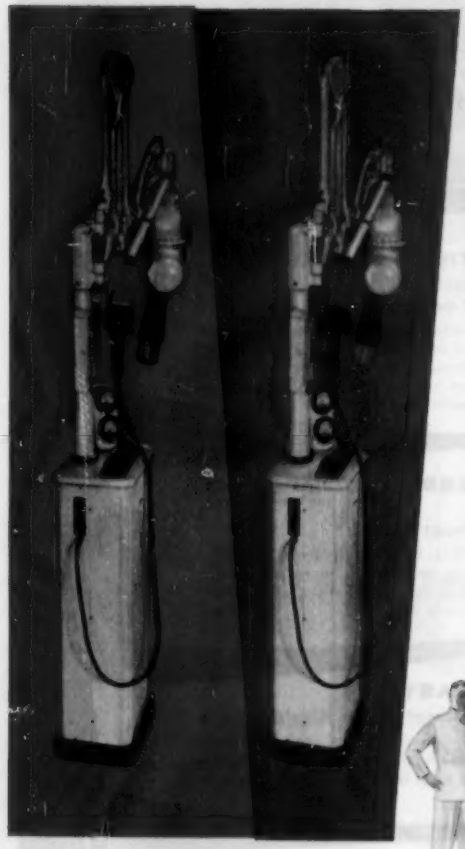

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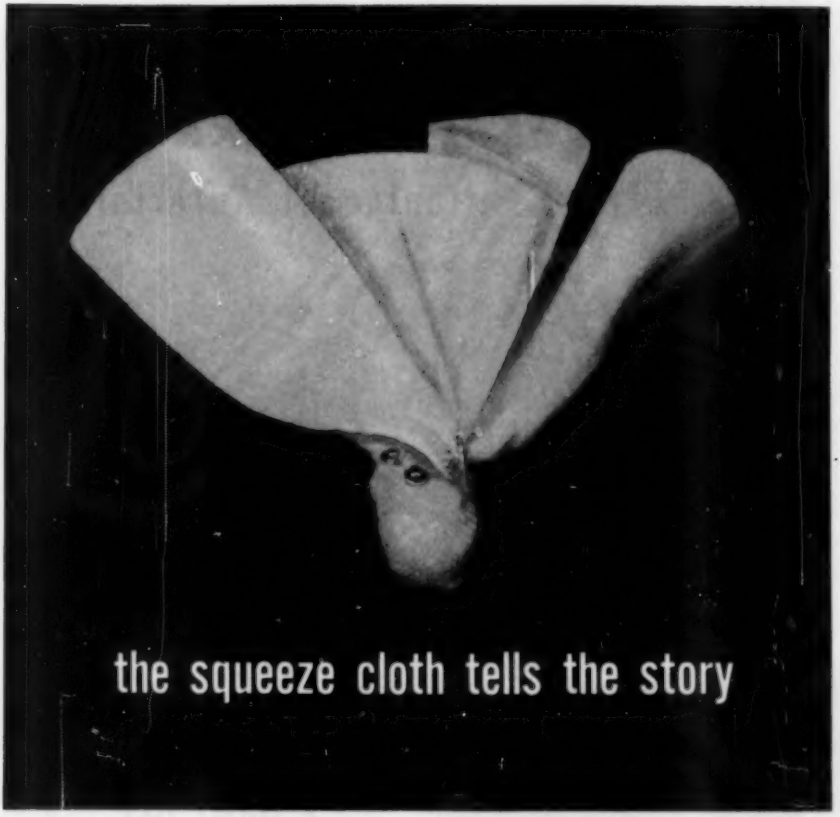

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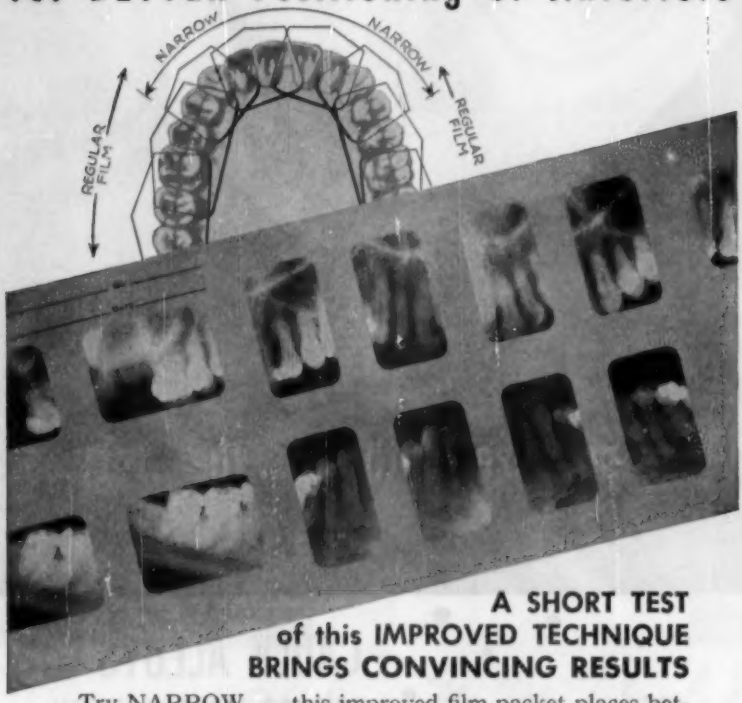

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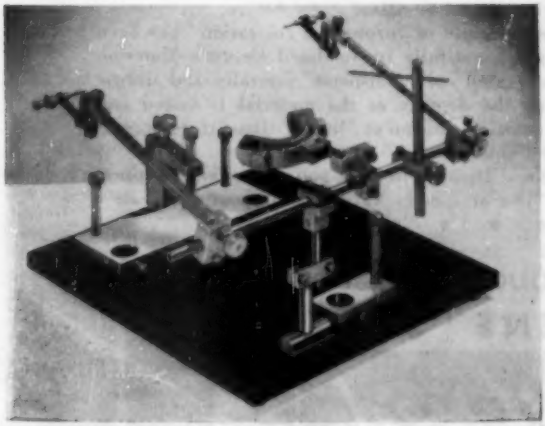
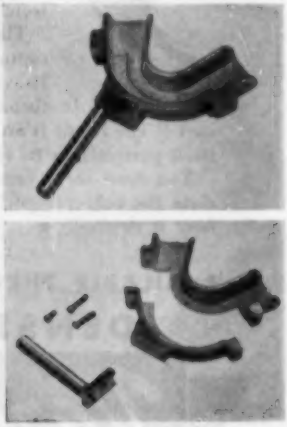


Adjustable Hinge Axis Facebow, Transfer Board and Clutch-Tray



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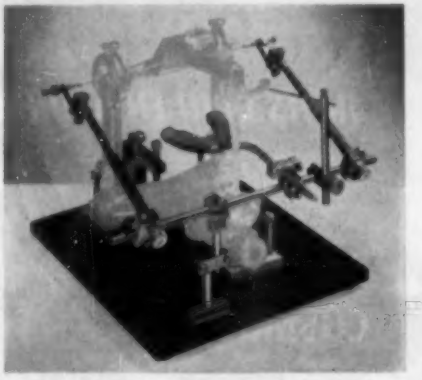
Full details are available from Hanau Engineering Company, Inc., Buffalo 9, N. Y. and from leading dental suppliers everywhere.



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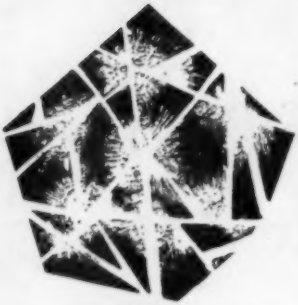

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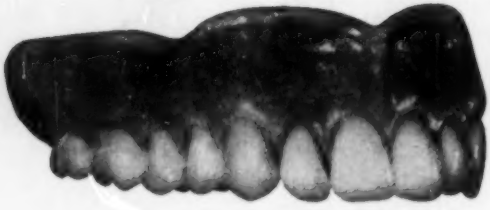

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